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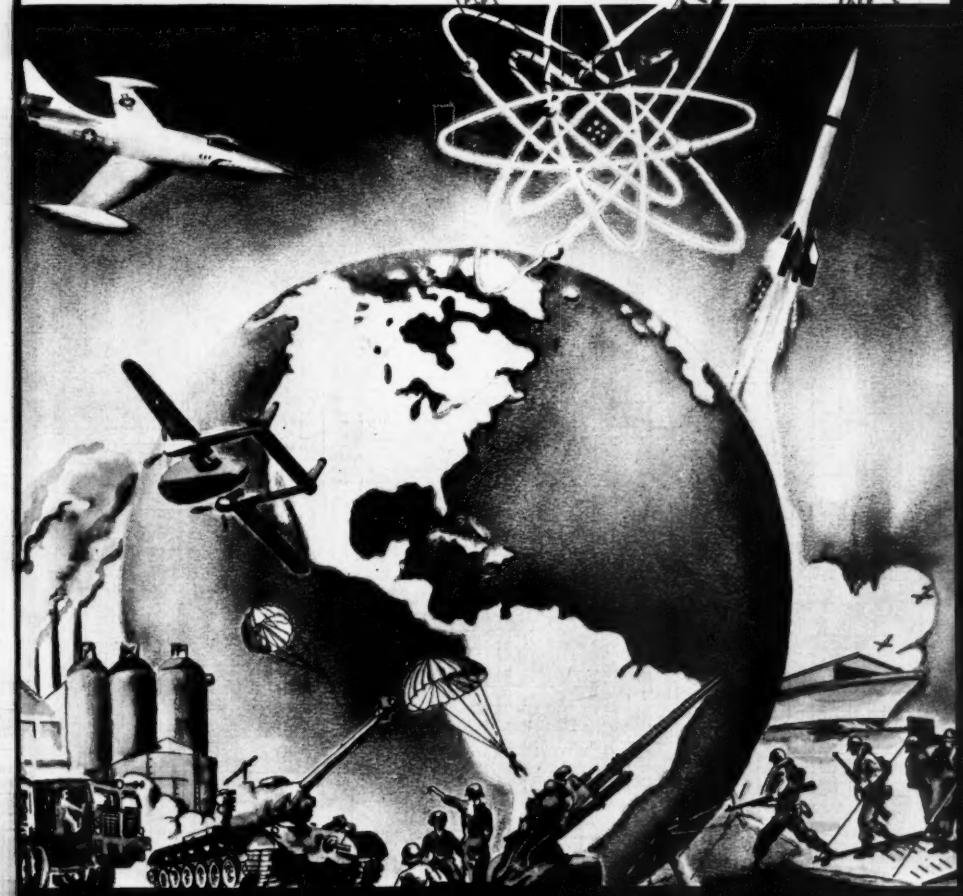

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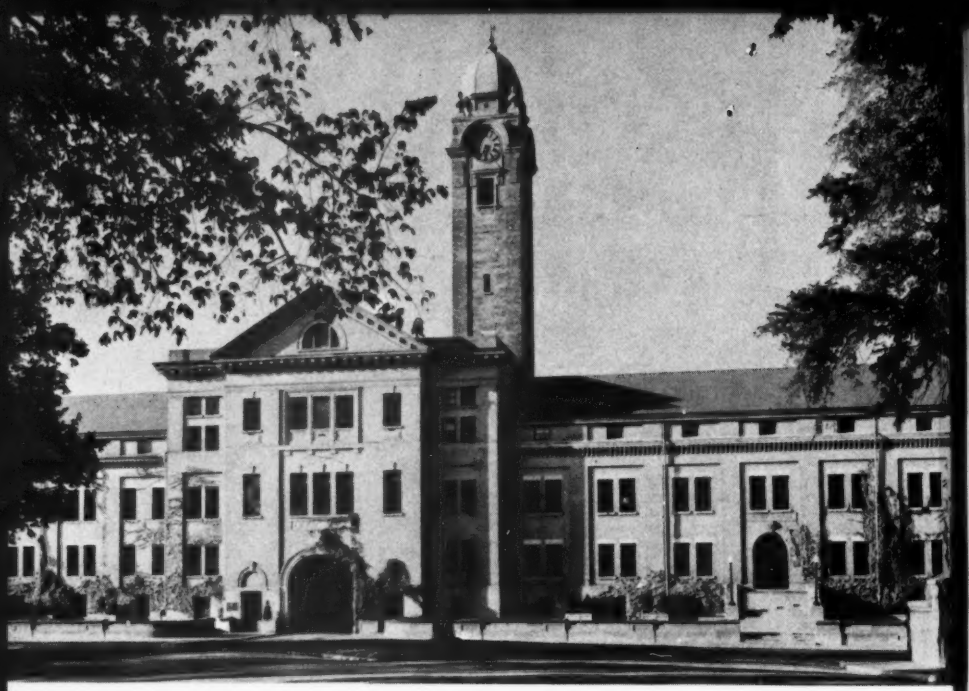

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MILITARY REVIEW

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THE ARMY'S PREPARATION FOR ATOMIC WARFARE

Lieutenant Colonel Jack J. Wagstaff, *Infantry*
Battalion Commander, 4th Infantry Division

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IN THIS atomic age the accusation that military leaders are not progressive is popular. It is said that officers habitually fail to look to the future and consequently the initial campaign of each new war is fought on the pattern of its predecessor. Naturally the charge is not accepted in good grace by officers, but the fact remains that many on duty today saw United States forces go into action in World War II with the equipment, tactics, and organizations which were largely developed for, and during, World War I. Again, the United States entered the Korean conflict using material, and even ammunition, from World War II. As a matter of fact these war surpluses saved the day—the war was conducted for about 6 months on World War II stocks. In the early days of Korea, commanders attempting to apply "European" tactics to Korean terrain almost lost the battle. All in all it would appear that there may be some truth to the charge that officers have tended to live in the past. The plain fact is that we must constantly look to the future if we are to exist in the atomic age.

Perhaps it was just such criticism which stirred Department of Defense officials. If not that, then for a better reason the United States is now expending tremendous efforts to incorporate new technological advances in our development of warfare. The result, it is said, is the "new look." The theory is based on the conduct of all-out atomic warfare on land, sea, and in the air. In adopting this concept, United States authorities considered in detail political, economic, and strategic factors. Basically, the "new look" provides for some reduction in our over-all military expenditures for conventional land and sea forces, but added emphasis is placed on the United States effort to organize and maintain the strongest and best atomic military force in the world—based primarily upon airpower.

It is not the purpose of this discussion to argue the merits of the "new look" of the Department of Defense, but rather our purpose is to consider the Department of the Army's responsibilities with respect to the effective implementation of this new concept.

Soviets

First, let us look at the Soviets. They also have a "new look" and it has brought certain new problems for them. For example, there is the most pressing one of catching up with the West. The problem

We will not have two armies; one for atomic warfare and a second to fulfill conventional requirements. We will have one army which must be capable of fulfilling any type of mission assigned—on short notice

is one of developing in the shortest possible time technological and industrial processes which will make the Soviet atomic capability comparable to the atomic power of the Western World. The Soviets are making undeniable progress, but it is not easy for them in light of the consumer demand of 210 million people.

On the contrary, it would appear that the "new look" has in certain respects eased problems which face the Soviet leaders. The Soviets—as do some Americans in places of influence—consider that atomic capabilities have reduced manpower requirements and this has permitted the over-all strength of the Soviets conventional military ground forces to remain static. The additional effort—which at one time was used for expansion—can now be expended on the development of atomic weapons. Of course, military expansion which stops at 175 ground divisions cannot be said to be the timid approach, and, moreover, the Soviet conventional military contingents are trained, equipped, and ready for action. The Soviet Union is putting some blue chips on atomic power as a safety factor but there is no indication that the importance of the "magnificent Soviet Army" is less important than ever. It could not be by accident that former Premier Malenkov stated publicly that an atomic war would destroy civilization. Perhaps Malenkov had no plans for destroying a world which in his opinion would inevitably be favored in the end by communism.

Air Force Responsibility

For the United States Air Force the problem is one of controlling an expansion whereby the added men, material, and other resources afforded that branch of the service can best be utilized to maintain effectively our over-all national military posture. From information made available to the public it would appear that the greatest proportion of the increase will be made available to the advocates of strength through strategic airpower.

From the point of view of the ground force commanders it might be suggested that certain other problems with respect to the conduct of effective tactical air support might be solved with the added assets now available to the Air Force. For example, not only is there a requirement for augmentation of the tactical air force, but there are also some technical air-ground support problems which remain to be solved. How will close support be afforded in the fast moving attack? Can close air followup be afforded now that short-range jet fighters require high-grade, well-prepared airfields? Is a longer-range plane or one capable of rough landings the answer, or could one suggest that floating airfields—carriers—be the solution? However, air-ground "new look" problems must be solved at another time.

Navy Responsibility

For the United States Navy the "new look" has presented problems too. Its commanders have stated that 50 conventional type ships must be placed in mothballs, including the famous *Missouri*. Atomic submarines are a reality—and if forecasts prove correct their operation in numbers will change the entire concept of ocean travel. The power of airborne atomic weapons which our ships would

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Lieutenant Colonel Jack J. Wagstaff served in Europe with the 69th Division during World War II. From 1945 to 1947, he was Chief of Staff, Allied Kommandatura, *Berlin, and subsequently was with the International Branch, Plans Division, GS, Department of the Army. A graduate of the Regular Course of the Command and General Staff College in 1952, he was sent to Trieste where he commanded the 3d Battalion, 351st Infantry. He was assigned to the Plans Division, GS, United States Army, Europe, in 1953-54, and is now in Germany commanding an infantry battalion of the 4th Division.*

carry to the enemy is revolutionary, and is so recognized by the Navy. Navy planners are continually working on new schemes which will permit the launching of missiles from any body of water. The tactical concept of defense by dispersion applies to Navy tactics in atomic warfare as surely as to infantry divisions. As President Eisenhower recently stated, there will never be another armada such as the one launched in the attack on the Normandy Beaches—that era is closed. The Navy recognizes the problems and is proceeding with the work required to fulfill its responsibilities in the atomic age.

Army Responsibility

Now, to the Army. The Army too has certain definite responsibilities to the Department of Defense in implementing the "new look." Oversimplification of the problems indicates that the major ones are: the reduction of troop strength without a corresponding reduction of the capability to fulfill its mission, and getting in step with the other services as a full teammate in the conduct of all-out atomic warfare.

Let us examine these problems. Troop reduction is relatively easy. The Secretary of the Army has been allotted a troop ceiling, and thereafter his allocation of manpower to various areas of the world is a relatively mechanical thing. However, the ability to fulfill Army worldwide responsibilities under this reduced troop ceiling is quite another thing. The theory upon which the Department of Defense is proceeding must be that atomic capability permits manpower reduction. For the purpose of this discussion we will accept that assumption.

With respect to the second problem—the development of Army atomic capabilities in step with its sister services—the Army is doing a good job. It has looked to the future. The following steps serve as examples. The 280-mm Atomic Gun has been developed, is in the field, and is capable today of supporting allied ground forces. Guided missiles are in being and are ready to go to work. The advanced courses of branch schools are teaching atomic tactics to senior officers.

Service corps schools have incorporated technical instruction in their curriculum, where appropriate, and, in addition, the Department of the Army has established certain technical and scientific schools for the further education of qualified atomic technicians and scientists. Army medical officers and other technical experts have studied, at firsthand, the effects of atomic explosions and methods of active and passive defense against such attacks. The effects of atomic weapons on both personnel and material are being studied carefully to determine the most effective use of these weapons against battlefield targets, and the integration of these weapons into the family of weapons now available to the ground forces. Organizational experts, together with tactical and technical specialists, are studying the problem of organization of ground units in the atomic age. It must be agreed that the Army has done, is doing, and will continue to do its part to keep abreast of the atomic age.

In fulfilling the task, the Army has, to date, moved cautiously, directly, and prudently toward the goal of developing adequately prepared forces and suitably mature concepts on the best method of conduct of atomic warfare. Such progress is commendable and the deliberate approach is a correct one. We must continue to look to the future. We must not fight the next war with the last war's weapons. However, no unbridled exponent of atomic warfare, no slovenly decisions, must place the Army in such a position that it will be unable to fulfill any assigned mission by conventional means.

The world today is shocked by the destructive power of the thermonuclear

bomb. Equally shocking to the old soldier are the changes necessarily rendered thereby to conventional type military organizations and strategic concepts. Of late we have become so dogmatic and glib in our discussions of the many aspects of atomic warfare that the fact comes as an equally great shock to some that wars will have to be fought—at least in part—by conventional means. Let us consider that statement.

In the most extreme case atomic warfare may be outlawed by political agreements between nations and no atomic war ever may be fought. Malenkov may well have set the stage for such a disarmament campaign with the statement that atomic warfare will destroy civilization. That idea is spreading. The chief of the East German Government—backed by his former master's statement—said that atomic wars should be outlawed. The United States Government, through our President, went on record again recently as being opposed to atomic warfare. It seems entirely possible—and to a lesser degree probable—that there will never be an atomic war. In such event the Army obviously must be ready to fulfill its mission by conventional means and do so with a minimum of reconversions, rearming, retraining, and retooling.

Although there may be no total prohibition of atomic weapons, local prohibitions may result from political, humane, or strategic reasons. In such case the particular campaign would revert to conventional type warfare. Here again the Army must be ready to go ahead without atomic support and without delay.

Regardless of the numbers of atomic weapons available, there will be times when objectives must be taken or defenses maintained by conventional means by reason of the very basic fact that atomic weapons either cannot be used, or the targets are not suitable for atomic attack. Moreover, unless each subordinate commander is allowed a definite number of weapons available on his call, all tactical plans must be drawn up with the thought in mind of conducting them on a conventional basis. A commander must plan to fight without atomic support and his organization and equipment must permit him to fight with what he has. Even after an atomic weapon is exploded the commander must be prepared to exploit that strike with conventional means—his army unit.

It is said, at least to date, that we have not developed atomic weapons that can be used efficiently on all types of targets. The unsuitability of a target may result from technical, tactical, or political reasons. Here again conditions beyond the control of the commander would prescribe that the battle would be fought on a conventional basis. Ground forces geared only to atomic warfare would find the going rough.

As has been indicated, in our effort to "atomize" the Army, the work will be difficult as we can go neither too far to the right or left, but rather we must hit the happy medium. We must not fight the next war with the last war's equipment. We must continue to look to the future and continue to prepare our organizations, tactics, and material so that the Army can take its place as a full member of the United States atomic warfare team.

At the same time such changes must be made with the thought in mind that we will not have two separate armies available; one for atomic warfare and the second for fulfilling conventional requirements. We will have one army, perhaps a small one, which must be able on short notice to fulfill any mission assigned, be it atomic or conventional in nature. This thought must be foremost in the mind of every officer as he contributes his part to the steady, thoughtful adaptation of our Army to the requirements of the future.

A STUDY OF REVOLUTION

Major S. J. Watson, *Royal Engineers, British Army*
Student, Command and General Staff College

The views expressed in this article are the author's and are not necessarily those of the Department of the Army, the Command and General Staff College, or the British War Office.—The Editor.

THE first Duke of Wellington once remarked: "I always had a horror of revolutionizing any country for a political object. I always said, 'If they rise of themselves, well and good, but do not stir them up; it is a fearful responsibility'." For many years this has typified the attitude of professional soldiers who are trained throughout their careers to uphold good order and military discipline, and are instinctively opposed to revolutionary movements based on the deliberate defiance of authority. So it was somewhat of a novelty when in World War II resistance movements assumed a strategic importance; and a military commander, hitherto accustomed to suppressing revolts in order to preserve or restore law and order, often found himself aiding and abetting insurrection as an instrument of military policy.

Looking back with belated wisdom after the elapse of a decade, it is now apparent that most wartime revolts were sponsored with a view to some immediate military advantage, but with imperfect understanding of their ultimate political repercussions; it is equally evident that, in the successful exploitation of insurrection, the Soviet Union was considerably more adept than the Western allies. The time is, therefore, opportune to make an objective examination of revolutions in general, and in particular to review the revolutionary techniques of the Soviet Communists; for the analysis of the basic features of past revolutions is an essential prerequisite to determining their likely course and consequences in the future. This subject will be examined under five main headings:

1. Revolutionary motives.
2. Conditions essential to revolution.
3. The sequence of revolution.
4. Soviet revolutionary techniques.
5. The prospects of anti-Soviet revolt.

Revolutionary Motives

Revolutions are either national, racial, social, or religious, and are expressed both in material terms and in the sphere of ideas. In every case the driving force is a sense of grievance, and the aggrieved generally fall into three distinct types—the *Idealists*, the *Mob*, and the *Placeseekers*.

Idealists pursue—more often emotionally than rationally—the hope of freeing from oppression their race or country or social class or religious sect without any regard for their own personal benefit. Their effect is not easy to predict. They are often fanatics whose sincerity does much to attract recruits and to inspire their followers to extraordinary efforts,

If the professional soldier understands the basic elements of revolution, he will not only be better able to suppress revolt within friendly territories, but also to further its cause in the country of his enemy

and they generally assist their cause with material contributions as generous as the almsgiving of religious devotees. On the other hand, their efforts are often dissipated through misapplication; for they have frequently been brought up to regard the pen as mightier than the sword, and are more skilled in dialectical discussion than in co-ordinating the forces of revolt. It is very rare to find Idealists who combine integrity with capacity like Oliver Cromwell, Lazare Carnot, and George Washington.

The Mob comprises a large number of ne'er-do-wells who are simply out for material gain; and they aim to get something, if not for nothing, at most for as little as possible. Aptly described in the *Internationale* as *les damnées de la terre*, they are basically antisocial: being natural anarchists, they need little encouragement to destroy for loot regardless of its policy. The destructive aspects of revolution are too easily forgotten; but the September Massacres by the Parisian mob in 1792, and the depredations of the *Sinn Fein* gunmen in 1922, should serve to remind us that violence and bloodshed should never be ignored when drawing up a revolutionary balance sheet.

The Placeseekers are really ne'er-do-wells operating at a higher level of intellectual development and administrative experience, and they see in a revolution the means to acquire for themselves the political power and material prosperity of which they feel themselves cheated under the existing regime. Calculating and utterly unscrupulous, they owe no allegiance except to their own ambitions, and they placate any surviving remnants of their consciences with Sir John Harrington's seventeenth century epigram:

Treason doth never prosper: what's the reason?
Why, if it prosper, none dare call it treason.

They do not hesitate to exploit the Mob as revolutionary cannon fodder at the same time as they cynically seduce some unwary Idealist to cloak their machinations with spurious respectability. Just as the Jacobins in 1793, proclaimed that "Anything which furthers the revolution is permissible" and Lenin on 13 December 1906, wrote that "Marxism is prepared to adopt any form of strife provided the means achieve the end," so the Placeseekers use every means to eliminate their personal and political opponents. It is, therefore, the Placeseekers that constitute the most sinister and the most influential elements of every insurrection, and history shows that Fouché and Trotsky are more typical end products of revolution than Carnot and Washington.

It can thus be seen that, although the three revolutionary types are all impelled by a sense of real or imagined grievance, their motives are quite distinct; and, although these may overlap momentarily, they seldom coincide. Of the participants in every revolution some will be regarded by posterity as heroes, some as traitors, some as martyrs, and some as monsters. This is due not to any caprice of history, but simply to the diversity of revolutionary motives.

It has been noted that the driving force in all revolutions is a sense of grievance. In every country there are ne'er-do-wells with a grudge against society, although their crude and unco-ordinated defiance seldom gets them further than the criminal courts. The situation becomes more seri-

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Major S. J. Watson is the author of "Christianity and Communism," which appeared in the April 1955 issue of the MILITARY REVIEW. *During World War II, he served in India, Iran, the Middle East, and the Central Mediterranean Forces. He was with the Directorate of Military Intelligence at the War Office, London, and subsequently stationed with the British Commonwealth Forces in Korea. He is now a student in the Regular Course of the Command and General Staff College.*

ous when grievances arise out of palpable injustices which arouse the sympathy of the Idealists: this serves to raise an issue onto a higher plane, bringing to it inspiration and enlarging the scope of its appeal. Finally, any cause which shows signs of prospering will attract Placeseekers who sooner or later adopt it as a vehicle for their own advancement.

Grievances may be national, due to foreign occupation; social, due to inequalities of wealth or privilege; religious, due to sectarian persecution; or racial, due to political and judicial discrimination. Of these, the social and racial grievances are often the more compelling, while the national and religious are, perhaps, the more inspiring: the former tend to emphasize class differences in society, while the latter tend to unite all classes against a common enemy.

When confronted with a grievance, a government can either remedy it or else suppress it. The former course will generally forestall any revolt; but, if the grievance has aroused only a small section of public opinion, the government's action may frequently offend the majority of the electorate and so bring about its fall from power. The latter course must be adopted if the remedy of the grievance involves departure from the government's political principles, or if the government is determined to enforce its authority regardless of the views of its opponents. In his biography of Talleyrand, the late Lord Norwich wrote that "revolutions can be suppressed by force, but they can never be tricked or bribed into submission." Thus, any governmental action must be firm and decisive, for history shows that attempts by moderate elements to compromise with revolutionary issues have, sooner or later, the effect of bringing extremists to power. For example, the vacillating Feuillants paved the way for the Jacobins' Reign of Terror in 1793, and Kerensky's well-meaning Provisional Government was soon ousted by the Bolsheviks in 1918. A counterrevolutionary regime must, therefore, be strong over-all, for it can survive no weakness whether due to internal schisms, to constitutional or clandestine opposition, to economic bankruptcy, or to military defeat: the greater its unpopularity, the greater must be its strength.

There are, therefore, three essentials for successful revolt: first, the existence of a grievance; second, the willingness of the aggrieved to strive for a remedy with practical effort, material support, and moral inspiration; and, third, a weak regime unable to stifle the revolutionary effort. As Lenin wrote in 1915:

Only when the lower classes do not want the old way, and when the upper classes cannot carry on in the old way—only then can revolution triumph.

There are certain other conditions which might seem conducive to revolution, such as the aftermath of war, the strength or weakness of a middle class in society, and the redistribution of population due to industrial changes or to the breakdown of tribal control in undeveloped countries; but these, after analysis, will be found merely contributory to one or more of the three essentials cited above.

The Sequence of Revolt

The sequence of any revolt comprises three phases: the preparatory phase, the action phase, and the consolidation phase.

The preparatory phase is primarily concerned with mobilizing the forces of revolt, in terms of both manpower and material resources; and this is generally achieved by exploiting some existing grievance, either racial, social, religious, or national. Although propaganda will be so framed as to invoke the widest possible sympathy inside and outside the country concerned, the decision to enlist outside aid requires careful consideration. The advantages are that the revolutionary

movement may thereby obtain sources of money and arms, or even a secure base for training or resting its forces; and the movement also gains prestige from the support of a powerful neighbor. The disadvantage is that the movement may, in return for such aid, find itself hampered in the long run by having to conform to the political doctrines or military strategy of an outside power.

The action phase marks the transition from covert subversion to overt action, and begins with a trial of strength which may initially be within the law. Legal strikes, processions, and demonstrations by Mob elements are all useful to show the flag of revolt, and to test the forces of law and order, provoking, if possible, some precipitate action which may make useful martyrs for the revolutionary cause. Concurrently, efforts will be made to infiltrate revolutionaries into influential positions, particularly in the police and the armed forces, and to suborn or win over as many government officials as possible. If the regime is weak, these measures may well suffice to bring about its fall, and the revolutionaries may achieve their *coup d'état* simply by rigging an extraordinary general election.

If, however, the regime, through strength or desperation, decides to use force, the revolutionaries must fight back to ensure their survival. Their aim will then be to terrorize and defeat, in detail, the forces of law and order: isolated individuals and outlying posts will be attacked and public utilities will be sabotaged over a widespread area, so that the government may be obliged to disperse its strength in response to popular clamor for local protection. Simultaneously, the insurgents will make every effort to ensure that the populace withholds all information about their movements from the forces of the government, and conversely, that revolutionary agents are supplied with timely news of the government's activities. Next, the insurgents will take control of outlying localities where they can develop bases and train recruits gained either by conversion or impressment. Finally, these localities will be merged to form a wide area wherein a revolutionary administration can be established, and eventually this regime may come to be recognized internationally as, at any rate, the *de facto* government of the country.

The consolidation phase is concerned with two important activities: the external struggle against counterrevolutionary forces, and the internal struggle for power among the revolutionaries themselves. The latter struggle includes the suppression of the anarchist Mob elements by Place-seekers better fitted to exercise the responsibilities of government, the supersession of the Idealists—except a few retained as figureheads for propaganda purposes—and the inevitable feuds among rival Place-seekers; so that even a successful revolution can become divided against itself, as was shown by the Free-Staters versus the Republicans in Ireland in 1922, and by the ELAS versus the EAM in Greece in 1944. These internal stresses may sometimes manifest themselves in a declaration of war by the revolutionary administration against its neighbors—as occurred both after the French Revolution in 1792, and after the Russian Revolution in 1918—in order to unite the various factions by a clarion call to defend both their newly won liberties and their national territory against the forces of intervention. War also provides an outlet for the predatory instincts of the Mob which, although useful in the action phase, are not conducive to good citizenship thereafter. It is during this consolidation phase that the new regime is potentially most vulnerable to the forces of counterrevolution. However, history shows that such forces usually lack not only a common purpose but any clear understanding of what they are fighting, with the result that revolutionary admin-

istrations have been able both to complete their consolidation at home and spread their influence abroad. It is not from mere sycophancy that a British contributor to a United States publication should here cite the example of the War of Independence; for he does so in order to sound a warning lest the very success of this historic venture should deceive the modern descendents of the "embattled farmers" at Lexington as to the ultimate benefits of revolutions elsewhere. Clearly, an unsuccessful revolt is bound to intensify any existing tyranny, as was brutally demonstrated in 1848 by Cavaignac in France, by Radetsky in Italy, and by Haynau in Hungary: also, it is equally clear that without a George Washington—and it is very rare for such a character to emerge—even a successful revolution is liable to end in a dictatorship, such as the dictatorships of Napoleon and Stalin. So, anybody who may ever have to consider sponsoring revolution in the future must try realistically to visualize the final outcome; and, in the absence of a Washington, he should ask himself whether tyrants—for example, the Nazis—who emerge after an unsuccessful revolution are preferable to tyrants—such as the Soviet Communists—who generally arise with a revolution that succeeds.

A Communist revolution attracts the same three types and follows the same sequence as any other insurrection, although its techniques are naturally adapted to take full advantage of the established Communist base in the Soviet Union and the potential threat of the Soviet Armed Forces. As Stalin himself explained:

The revolution which has been victorious in one country (Russia) must regard itself not as a self-sufficient entity but as an aid, a means, for hastening the victory of the Proletariat in all countries.

Encouraged by this powerful support, there are many Placeseekers who have chosen to ride on the bandwagon of world revolution and to follow, cynically and minutely, every change and even reversal of the Party Line in order to keep themselves in favor with the Communist hierarchy in Moscow.

During the preparatory phase, these agents, concealing their true mission, identify themselves with any issue likely to discredit or weaken the government in office, and all the time they insidiously spread the doctrines of the Politburo. There are always elements of the Mob—or "Proletariat" in Marxian terminology—who need little persuading that their disabilities are due not to any fault of their own, but to the social inequalities inherent in Western democracy, and there are many Idealists who can be attracted by cunning appeals to their intellects and emotions. When there is no real discontent, the Communists tempt interested parties by professing to achieve, by unofficial strikes and other unorthodox means, more spectacular and swifter results than those obtainable through official processes. However, although they pose as the only arbiters of justice to all who may be chafing under "the law's delays," they have in reality the covert aim of actually hindering reforms and the proper administration of justice in order to stir up popular discontent against the government.

In the action phase, the Soviet leaders sponsor, according to circumstances, either a "war by proxy" as in Korea in 1950, or a "conquest from within" as in Czechoslovakia in 1948. In each, all the dirty work of world revolution is carried out by indigenous Communists purporting to represent the "spontaneous upsurge of the Proletariat." The Politburo in Moscow, reinforced by the implicit threat of the Soviet Army in the background, continues to furnish both precept and precedent: it will, of course, dissociate itself from failure, but it has never failed to

take the fullest possible credit for success. In politically developed countries, the infiltration of Communists into the key ministries of defense, justice, and finance normally suffices to achieve a *coup d'état* with little or no bloodshed. When the Communists resort to arms, they endeavor to capture a slice of territory, as in Indochina, where a Communist administration may be installed; and this regime —when firmly established—is promptly sponsored by Moscow for international recognition.

In the consolidation phase, the Communist technique is now well known. As soon as possible a police state is established wherein all constitutional opposition is stifled: then the new regime is confirmed in power by bogus elections. Next comes the purging of the revolutionary elements themselves—the so-called unmasking of reactionary traitors, national deviationists, and imperialistic agents—with a concurrent campaign against religion culminating in the establishment of a schismatic and Erastian Church. Finally, the country's armed forces and national economy are harnessed to the Soviet Union, and every feature of daily life is approached from "the only valid criterion—whether it assists the establishment of communism and how it trains the people who are engaged in building communism." Particular attention is always given to indoctrinating the younger generations who will, as times goes on, increasingly outnumber their disillusioned elders.

Anti-Soviet Revolt

In recent years there has been much wishful thinking, and many subjective dissertations by refugees from Iron Curtain countries, about the prospects of anti-Soviet revolt. Objectively, however, the prospects must be assessed in relation to the three prerequisites of any successful revolution—the existence of grievances, determination to rectify such grievances, and a weak regime unable to suppress the revolutionary effort.

An important characteristic of Communist revolutions is that they merely change the outward symptoms of discontent without being able to remedy its underlying causes—especially those springing from the weaknesses of human nature. The problem of unemployment is only superficially solved by the introduction of forced labor; the farmers' economic problems are not premanently alleviated by compulsory collectivization; and political power is more flagrantly abused when seized by people who are neither trained nor prepared to exercise their authority with constructive impartiality. Thus, under a Communist regime, a wide range of grievances still persist even though they may have been transferred from certain sections of the population to others. To these is added further discontent arising from religious persecution and the suppression of national patriotism in the cause of complete subservience to the Politburo in Moscow.

There are, thus, anti-Communists representative of the three main revolutionary types. First, the ne'er-do-well elements of the Mob are no less "agin' the Government" under a Communist regime; indeed, their inherent grudges may well be intensified by their belated discovery that in practice the promised "dictatorship of the Proletariat" is merely a dictatorship by the Communist Party purporting to act on behalf of the Proletariat—which is not the same thing at all. Such people, however, are soon rounded up for forced labor, although a few contrive to escape to the mountains or forests where they can adopt a life of brigandage in *Comitaji* bands. Second, there is opposition from Idealists springing from misled theorists disillusioned by the methods of communism in practice; from patriots who resent the suppression of nationalism; and from the Christian Church, aroused by persecu-

tion, which is capable of inspiring its members to an extraordinary degree in the face of privations and death itself: but their unaided efforts are incapable of effective expression or achievement. Third, there are, undoubtedly, some Placeseekers whose ambitions have been thwarted by the promotion of their professional subordinates or intellectual inferiors who have somehow won favor with the Party; but they generally mask their disappointment in the interests of expedience, and refrain from changing sides unless or until the anti-Communist cause shows signs of succeeding.

The foregoing diversity of motives greatly complicates the successful co-ordination of an anti-Communist insurrection. Such a task would entail material aid and strategic direction, both of which would have to come from some friendly nation with which a secure means of communication could be established through some chink in the Iron Curtain. An effective anti-Communist movement is not able to spring up overnight, and the necessarily long process of its evolution may sorely try the patience of its followers who are naturally eager for swift and spectacular action; but any premature rising, merely resulting in the loss of indispensable leaders and the compromising of their organization, would be worse than useless. There can be no empirical calculation of "R-day": it must depend primarily on the effective strength of the revolutionary movement over-all, and on the current weaknesses of the Communist administration.

Communist Weaknesses

Those who talk glibly about revolutionary movements behind the Iron Curtain should recollect that in no country has there yet been a successful anti-Communist insurrection; for, despite the many grievances engendered under Communist rule, the regime has always been too strong to be overthrown from within, and no outside powers have been able to conquer it by direct assault or by an effective war-by-proxy. In totalitarian countries a government does not fall simply through its unpopularity with the electorate: therefore, in order to find the "Achilles' heel" of a Communist administration, one must try to discover how far the seeds of its destruction are contained *within itself;* and it is, therefore, profitable to examine the long-term implications of the Soviet Communists' subservience to dogma and preoccupation with security.

Under Soviet communism all culture, scientific research, and economic theory are subordinated to the Party Line; and all past and present facts—even those relating to anti-Communist activity—are distorted to conform to the doctrine of the Politburo. This doctrine is not always infallible, and there is, therefore, some long-term hope of critical disillusionment among the intelligentsia from which the principal administrators are necessarily recruited—especially where many of them can still remember the better days of their country's former independence. As Freda Utley has written in *Lost Illusion:*

You believe what you wish to believe, until experience bangs your head against the wall and awakens you from dreams founded on hope, a misreading of history, and ignorance both of human psychology and science.

The Communist regime's preoccupation with security arises not only from its local unpopularity, but also from Stalin's doctrinaire warnings that the Imperialist powers, in their last despairing effort to stave off their collapse brought about by their own "inherent contradictions," will make an all-out attack against the Communist bloc. The security of a Communist state thus depends upon the existence of secret police to guard against internal subversion and armed forces for protec-

tion against the external threat. History shows, however, that these two organizations are fundamentally incompatible, and that each is quick to resent the encroachment of the other. In the Soviet Union herself, there is a seesaw struggle for power between the Armed Forces and the MGB (The Soviet Ministry of State Security) as has been shown by the purge of Marshal Tukachevsky in 1937, and the liquidation of Lavrenti Beria in 1953.

The Soviet Union has so far survived these weaknesses because her vast size has enabled the effect of local famines, insurrections, and other troubles to be isolated from the rest of the country; because she has possessed the resources in both manpower and matériel to offset disasters caused by administrative errors of judgment and policy; and—last but not least—because the non-Communist powers have hitherto been divided among themselves so that the forces of counterrevolution have soon disintegrated. The Soviet Union now stands as a bulwark behind all the Iron Curtain states to underwrite their regime and, with the threat of her Armed Forces, to discourage reactionary intervention. Thus, the best hope of any anti-Communist movement behind the Iron Curtain would be to enlist the support of an outside power, or alliance of powers, whose strength the Soviet Union declines to challenge; or, alternatively, to time its insurrection when the Soviet regime may be distracted by war or dissipated by internal troubles. Otherwise it would be wishful thinking to suppose that any counterrevolution would ever be able to achieve success.

All revolutions, whatever their auspices, follow a definite sequence of development; and they depend for their success on three main factors:

1. The existence of a grievance.
2. Determination to strive for a remedy.
3. A weak regime unable to suppress the revolutionary effort.

Conclusions

Revolutions attract all types and conditions of man, of whom there are three prominent types—the Mob, the Idealists, and the Placeseekers—whose diverse interests require careful and skillful coordination. These considerations apply equally to both Communist and anti-Communist revolutions; and, in addition, the technique of the former is adopted to profit by the bulwark of the Soviet Union, while the latter must seek outside aid to counteract Soviet influence.

Professional soldiers, who are trained throughout their careers to uphold military discipline, are instinctively opposed to revolutionary movements based on the deliberate defiance of authority. Nevertheless, a commander may—in the event of total war—find himself embroiled in ideological issues where the sponsoring of insurrection becomes an instrument of military policy. He must then try realistically to visualize the eventual outcome, and draw up an objective balance sheet to weigh the short-term strategical considerations against the more indelible long-term political repercussions both inside and outside the country concerned.

As Karl Marx himself has written:

Insurrection is an art just as much as war or any other, and subject to certain rules of proceeding which, if neglected, will produce the ruin of the party neglecting them.

It is, therefore, important for every soldier to make some study of revolution; so that, having grasped its basic elements, he may be able to forestall or suppress it in friendly territories, and, if necessary, further its cause in the lands of his country's enemies.

KEEP IT SAFE

Brigadier General Thomas F. Van Natta, *United States Army*
Army Attaché, American Embassy, Mexico City, Mexico

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IN THE *Reader's Digest* of March 1953, there was an article about an American unit in Korea that had picked up an elderly Korean man and carried him through combat. Intelligence was suspicious of his background and had refused to clear him for an interpreter's position, but Pak was willing and cheerful, and he spoke some English, so he was taken along. He became increasingly useful and at several critical times proved his worth by a display of initiative and by being able to speak Chinese. His loyalty and integrity were established beyond doubt.

The main point of the story, of course, is the character, integrity, and loyalty of Pak who—in spite of an unprepossessing appearance and the handicap of age (40 is very old for combat)—won the sincere admiration and respect of the Americans. But there is also a fairly obvious secondary point: Pak was rejected by officialdom—G2 in this case—and his value was uncovered only because the Americans went ahead and used him anyway. They did not violate orders—for G2 had only refused to clear Pak; there had been no direct prohibition to use him. But since an interpreter or an interrogator must know our own plans and desires to a considerable extent, failure to clear an individual is, in effect, denying him such employment. G2 was wrong, and American initiative and unwillingness to obey authority blindly saved the day.

This American initiative and rejection of blind obedience is probably more responsible than any other single factor for putting us where we are today. If we should lose it or stifle it, we surrender our most valuable advantage over the Communists—or any other totalitarian group. However, American initiative, when it charges ahead and flouts authority without due consideration, can make grotesque mistakes. Here are two similar tales. The first one was funny, and caused only some red faces.

An American unit—as it was so easy to do in Korea—acquired a Korean helper. Lee was intelligent, willing, and hard working. These virtues are surprisingly common among Koreans, but Lee spoke fairly good English, and this was not common. Afraid someone higher up would pre-empt their valuable find, the unit "forgot" to report Lee to G2 for a routine security check. If G2 cleared him, Lee would probably be snapped up as an interpreter; on the other hand, if G2 rejected him, they might have to give him up.

Security regulations are intended to protect, not to stifle, initiative. If they become too oppressive, the intelligent solution appears to be to alter the regulations, or their application, not break or ignore them

Lee, of course, never complained. As the unit moved north, Lee rode along happily, always willing to work, always cheerful, and extremely useful with his increasingly fluent English. Six months later —and in the frontlines—Lee had become a trusted assistant. He had shown leadership and initiative, so he was given increasing responsibility in handling other Koreans and in supervising labor jobs. He had been taught to drive a jeep, and was allowed to go alone with it on official errands.

However, one of these took him a little too far one day and Lee was picked up at a roving Military Police check point. His trip ticket was correct, but the Military Police asked to see his driver's license. When none could be produced, Lee went into routine "lock up" and his unit was notified. A sergeant promptly appeared to vouch for Lee and get him back. However, while Lee was in Military Police hands, a Counter Intelligence Corps agent had gone through the prisoners—again on a routine check—and, finding Lee with no papers other than an unofficial pass signed by someone in his outfit, sent his name and fingerprints in for check. With the answer came two Military Policemen; Lee was a North Korean lieutenant and an escaped prisoner of war from Koje Do.

When accused, Lee promptly admitted the truth. He had escaped and was on his way back to North Korea. He was still looking for an opportunity to slip through the lines and rejoin the Communist forces. There was no harm done, and the incident ended with some kidding and laughter at the expense of Lee's employers.

The second story is tragic. A battalion was losing too many men on patrols. Either an enemy ambush caught them going out or a counterpatrol intercepted their return. At first this was ascribed to faulty planning, but when first the regimental commander and later the division commander personally checked patrol plans, preparation, and co-ordination, and the enemy still showed uncanny ability to intercept the battalion patrols, it was obvious that information was being passed somehow. G2 threw all his resources into the hunt, and every possible potential leak was checked. Rear areas were searched for possible infiltrators, telephone lines were inspected thoroughly and monitors established, and radio procedures were checked and re-checked. Even the security clearances of Americans handling the patrol information were re-checked. Nothing was discovered, however, and the toll of killed and wounded mounted. Finally, at one of the Counter Intelligence Corps interrogations, a corporal asked, "Has anyone checked Kim?" Who was Kim?

You can guess the answer. Kim was an intelligent, willing Korean, always cheerful, with a pleasant personality and a good command of English. Of course, he had never been reported to G2 for security check. Various reasons were given: because Kim occasionally wore a South Korean uniform they assumed that he was a Republic of Korea (ROK) officer; because Kim always had plenty of money he was assumed to be on the ROK payroll.

Kim had shown himself unusually adept at map reading, so he had been taught triangulation and artillery spotting. He was used to carry messages to the ad-

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Brigadier General Thomas F. Van Natta was graduated from the United States Military Academy in 1928. He served as instructor at the Academy, and subsequently went to Paraguay as Military Attaché. During World War II, he participated in the Second and Third Burma Compaigns and Chinese Offensive. From 1946 to 1950, he was an instructor at the Command and General Staff College. He served in Korea as Assistant Chief of Staff, G2, Eighth Army for 20 months, and in June 1953, was appointed Assistant Chief of Staff, G2, Army Field Forces. He is presently Army Attaché, American Embassy, Mexico City.

jacent ROK division. He was provided with American clothing. He was allowed to see operations maps that showed the entire division front. And he was given —to carry to the adjacent ROK units— the battalion patrol plans.

The ROKs, when queried, said they had accepted Kim because he claimed to be a United States interpreter and wore a United States uniform. Also, Kim had never tried to get any information from them so they were not too concerned about him. They had never given him any information, and the ROK patrols were having no unusual casualties.

Kim was put out of action, and the battalion's patrol casualties dropped to normal.

The story about Pak, who saved the day with his Chinese, should not be discounted. G2s are human, and will make mistakes, and since security checks in a foreign country in wartime are never very certain, security cases were usually decided on the cautious side and probably caused a number of units unnecessarily to lose the services of some helpful Koreans. However, because G2s make mistakes is no reason to flout rules which are based on commonsense.

Certainly, many charming, hard working Koreans fully merited any affection and protection bestowed on them. But being charming and hard working does not prove they are not spies. The enemy is not stupid. The agents he selects are most apt to be charming, willing, and possessed of adequate English. One successful enemy agent can do tremendous damage in a very short time—especially if he has worked his way into our confidence.

Lee was not an agent, which is probably why he did no harm: he had not been trained and he did not know how to go about it. He was just an officer of an enemy army, trying to rejoin his outfit so he could keep fighting for communism.

Kim's box score cannot be determined exactly. He admitted to having been an agent, and told how he had operated in this case. Reconstruction of every detail was not possible, but subtracting the average patrol losses from those of the battalion, credits Kim with possibly a dozen Americans—killed or wounded. This was a grim price to pay for an interpreter, even if he were willing and cheerful.

The goal, of course, lies somewhere between the blind rejection of Pak and the equally blind acceptance of Lee and Kim. Security regulations are intended to protect, not stifle. If they become too oppressive, the best solution is to modify the regulations or their application, not break or ignore them. Initiative must be encouraged and developed, and new ideas must be welcomed. However, security and initiative must be brought together, and neither allowed to nullify the other, for a serious mistake in war is not paid for just with dollars, or materials—it also takes men's lives.

Another facet of the free world's adequate military strength is intelligence. The free world must have adequate and timely intelligence regarding both the intentions and the capabilities of a potential enemy. Without intelligence we may easily blunder into war, we may risk wasting our precious resources, or we may miss a vital chance to lessen tension when and if that really becomes possible. Certainly, a good intelligence system is indispensable to the successful prosecution and conclusion of any war.

Secretary of the Navy Charles S. Thomas

FOREIGN AID AND THE ARMY

Colonel Walter E. Sewell, *Infantry*
Commanding Officer, 31st Infantry Regiment, 7th Infantry Division, Korea

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

AN AMERICAN doctor, the Chief of a Public Health Mission, was discouraged when he saw the native women washing hospital linen on the river bank, as they had done 18 months before when he arrived in the country. Since that time he had spent thousands of United States Foreign Aid dollars to install in the native hospital a modern laundry, equipped with all the latest machinery. He asked the hospital superintendent why the women had gone back to using the river rather than the laundry. The superintendent explained that something was wrong with the machinery, and no one on the staff could fix it. He added that such was never the case with the river. It was there before the Americans came, and it would be there long after they had gone.

Actually, the machinery was repaired and the laundry put back into operation, because there were American technicians on the ground. But when they leave, as the superintendent intimated, some failure will bring the entire apparatus to a halt. The machinery is too complex for the native mechanics. The women will go back to the river, and the laundry will be a nuisance until it can be dismantled to make the space available for a useful purpose.

This is not an isolated case of a misguided doctor, but rather typical of what is going on in many parts of the free world. Nor is the fruitless effort limited to the medical sciences. We are faced with the problem of assisting such nations as Turkey, Pakistan, and the Philippines, in the development of strength sufficient to resist subversion from within and attack from without. The building of real strength involves us in practically every field of national activity—agriculture, industry, business, government, the armed forces, and the press. Americans move in to "assist" with a predetermined panacea for all the local ills. The standard goal is "modernization," whatever that may mean, when applied to a country living its own way in the twentieth century. However, definitions are not generally allowed to restrict our theory, nor are facts allowed to change our practice.

Americanization

Actually, "modernization"—as we use the term and apply it in "assisting" other countries—means "Americanization," as far as methods and machines are concerned. The process does not extend to the native population, for political and other reasons, and therein lies the main reason why we have failed more often than we have succeeded.

We give the native dairyman an electric milking machine with cooling apparatus. We give the native farmer a tractor with a 4-row plow. We give the native drayman a cargo truck with an automatic shift. And so the story goes.

However, this machinery is too complex. There is not the necessary mechanical ex-

perience available in the native population to keep it going. All machinery requires understanding operation, periodic maintenance, and unforeseeable repairs. Without these, machinery becomes a liability rather than an asset. The milking machine which is out of order does not fill the milk cans. A maid with a bucket is much more effective. The tractor that will not run—even with a 4-row plow behind it—will not till the soil. An ox with a good plowstock and share will get the job done. A truck that is broken down does not deliver the goods. Still, a horse and wagon or a pack burro have been doing the job for years.

Therefore, we might be providing more real assistance if we concentrated on buckets, plowshares, and wagons, which the natives understand and can use. There is progress in replacing the earthen pot with the enamel bucket, and it is lasting progress. The minor repairs which the bucket will require are well within the capabilities of the native dairyman. There will be no going back to the heavy earthen pot, and the American will be given credit for lightening the natives' load. We will have made a friend and, perhaps, a customer.

As it is now with the milking machine, we are probably doing more harm than good. When it breaks down the native goes back to the earthen jar with the impression that American machinery is no good because it will not run. Therefore, we are left with neither a friend nor a customer.

Actually, our machinery does not have a chance from the beginning, because there does not exist, within many countries, the know-how to operate and maintain it. And we are doing little or nothing toward developing the required technicians. It is true that we give some superficial training to a selected few; but even this cannot extend to changing models and new designs. We are in too big a hurry.

This "modernization" formula of ours goes far beyond machines and gadgets. It embraces practically every phase of human endeavor. In government, we expect a country to change overnight from a dictatorship to a democracy, Model United States of America 1954. We fail to realize that it took 175 years to develop the machinery which we have today, and to learn how to use that machinery effectively—and sometimes we seem not to have mastered all the details. The original Republic was a far simpler organization and required far less experience and skill to operate. Our forefathers, with very little education and no training in democratic methods, kept this machine running. Natives of an underdeveloped country with new-found freedoms could keep a similar machine functioning, and, in doing so, could learn the ways of democracy and grow in governmental dexterity. We cannot expect them to begin with all the bureaucracy of present-day Washington and carry on effectively. It is no wonder that they say that the machinery of democratic government is too complex.

In public health and sanitation, we start with modern slaughter houses and pasteurization plants. Then the native butcher throws the meat across the back of a burro and strolls up and down the sun-baked streets cutting off meat for his customers. The native milkman pours the milk into open rusty cans and eventually into the housewife's bowl or pitcher.

Nutrition has received considerable at-

The aim of our Foreign Aid Program should be to produce combat power without American technical support—this is something which we have not been able to achieve, up to the present time, to any great extent

tention and well it should, because much of the population of the underdeveloped areas lacks a balanced diet. Moreover, a change in diet might well provide much needed outlets for our agricultural surplus. We teach the native farmer how to grow lettuce, and he feeds it to his cattle. He does not like it and has not been convinced that it is good for his health. He is not going to discard what he has been eating all his life, and naturally has a taste for, and substitute something new and strange just because a foreigner advocates such drastic measures. He will have to be educated.

Skindeep Methods

In many other fields the story is the same. Our results are just skindeep. Our efforts fail to accomplish the ultimate purpose. We mean well, of course, but that does not transform failure into success, nor folly into wisdom. The failure and folly of most of our efforts are the result of the fact that the average man—the native John Doe—does not do his part. He does not because he does not see the point. No one has explained to him what he is supposed to do—much less why. Therefore, it is quite natural for him to go his own way—the way he knows, the way he likes, and the way he trusts. He will continue along that path until someone shows him another way and convinces him that it is better. This is a tremendous task, and one which cannot be done overnight. There are millions of John Does and educating them or re-educating them is a gigantic undertaking.

Yet, it is not impossible; it is not even unnatural. Rather, it is our own way of life. We devote a great deal of our effort to the development of new gadgets or improving old ones, and learning how to use them. In fact, this is the life blood of free enterprise, in theory and in practice, and the vitality of American business is largely dependent upon the time required to educate or re-educate the public. The problem of time has been largely solved—or completely solved—according to the advertising agencies. Of course, the gap to be spanned is not generally great, or, if it is, we resort to taking it by degrees, starting from the *status quo*. This same formula, "taking it by degrees, starting from the *status quo*," is eminently applicable to "foreign aid," and it is the only formula that will work. We should be the last people to take issue with this procedure, because we have adhered to it and proved its validity in every phase of our national life.

Education and Training

The importance which we place upon education and training—formal and informal, adult and juvenile—is evidenced by the time we spend in schools, short courses, lectures, and seminars. No people on earth have more schools of various types than we do. Compulsory education is taken for granted. Everybody is going to school or taking a special course of training. Model changes from year to year are the signal for dealers to send their repairmen to school. In fact, "factory-trained mechanics" are just good business and expected by all customers these days. Thus, we consider it essential to keep training an American who has several years of academic schooling, perhaps some vocational

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Colonel Walter E. Sewell is a frequent contributor to the MILITARY REVIEW. *His major assignments during World War II included Military Attaché to Uruguay and Paraguay, Joint United States-Brazil Military Commission in Brazil, and Chief Liaison Officer with the Brazilian Expeditionary Force in Italy. From 1946 to 1949, he was Chief of Education, Armed Forces Information and Education Division, Washington. He served as Commanding Officer, 87th Regiment, 10th Infantry Division, Fort Riley, Kansas, and as Professor of Military Science and Tactics, State University of Iowa. He is presently commanding the 31st Regiment, 7th Infantry Division, Eighth Army, Korea.*

education, and practically a lifetime of mechanical experience. We know that with us, men and machines must keep pace with each other. We have not seemed to realize that the same is true everywhere with all peoples. "Modernization" must be an all-embracing effort including men as well as things and methods and organizations.

Thus, developing skills and techniques among the peoples of an underdeveloped country lies at the very foundation of genuine "assistance." This development, like all effective instruction, must begin with the known and proceed to the unknown. Unfortunately, in many areas of the world today, the known among the masses consists of a spoken language, but one which they cannot read and write. Thus, reading, writing, and arithmetic—the three Rs—are our starting point. This is discouraging, of course, but there is no other answer in a country where the population is largely illiterate. Such countries are not rare; illiteracy among adults in many areas of the world reaches 50, 60, and even 80 percent. These adults must first be taught to read, write, and figure before they can be developed into "factory-trained mechanics"—before they can handle the machinery of a democratic government, of a free press, or of an industrialized society. Of course, bare literacy training is not enough; elementary, secondary, vocational, and higher education must be prosecuted for those equipped to take it. Thus, the problem resolves itself into one of "modernizing" the people as we "modernize" their machinery. It is a simple matter for us to provide up-to-date mechanical equipment, and it can be done with dispatch. Moreover, it gives the appearance of phenomenal progress; it makes the administrators look good; and there is something to show for all the time, effort, money, and personnel assigned to the project. The visiting firemen are impressed much more than they would be with statistics on rising educational levels and increasing technical skills among the people.

Our foreign aid personnel realize that, and their jobs may depend on the impressions of the visiting firemen. Therefore, they concentrate on the tangible—on the machines, on the gadgets. They are not too different from other people in the same situation. Many a college president has put most of his funds into modernizing the physical plant while letting the faculty become obsolescent, because new buildings and more acreage catch the eyes of the public and of the trustees—where great scholars cannot be depended upon to get any more support than, and often not as much as, good social mixers. The difference, of course, is that for the student, the faculty of great scholars makes his college years an educational experience, whereas the faculty of good mixers makes them an intellectual vacuum. In the case of the college, this foolishness or knavery will be discovered and the situation corrected without serious consequences to other than a few individuals. However, in the case of nations, who are our allies, the consequences can be tragic; we cannot afford to waste the time, much less the money and the effort, which skin-deep measures produce.

Military Training

It seems contradictory to classify time as a vital element and to concurrently propose education of the masses, because education to us is time consuming—a matter of years. We do not have the years to spend if these peoples are to make their contribution to the present struggle for freedom. We want to develop economic, political, and military strength in the nations of the free world, and we want that strength to be realizable and recognizable by friend and foe as quickly as possible.

This can be done even in a short time while based solidly on education. The most

important segment of the population, as far as progress is concerned, is the young man at the beginning of his productive years. Where is he at that age? In most countries he is in the army, because compulsory military training is widespread among the nations of the world. During his military service he can be educated as well as trained as a soldier. Some armies prescribe literacy training for recruits but, as a general rule, the programs, when not ignored, are ineffectively prosecuted. As a result, the soldier leaves the army, after his service of a year or more, still unable to read and write. Actually, the illiterate can be taught the three Rs—up to about the fourth-grade level—in 4 months or less. At the present time, the United States Army has a program of literacy and military training for the 1 man in 10 who cannot read and write. This program is conducted by Army personnel and educators. Its cost is small and the time lost from purely military training is very little; many reach fourth-grade level in 2 to 4 weeks. Moreover, the individual can then be trained to be an effective soldier in a modern army, while as an illiterate he could never have been taught to carry his part of the load in today's military operations. In a few weeks what would have been a permanent liability has been made a definite asset. Actually, there are practically no jobs left in the United States Army which can be filled by an illiterate. Every soldier must be able to read, write, and figure. The short time required now to teach these skills leaves no doubt as to the value of the program. It should be noted that the speed is primarily the result of the control which the Army has over the individual and to the training aids which are used. In particular, the Army has developed texts which are intimately connected with the soldier's job and environment; they concentrate on words like R-I-F-L-E and F-L-A-G rather than on C-A-T and D-O-G.

This same idea can be incorporated into any army, and can be enlarged to include secondary and vocational education. The texts and training aids could be *adapted* to the native soldier. They should certainly *not be translated* literally; the words and illustrations must belong to the student's environment. The preparation of these materials is vital to the success of the program and should be done by experts. The critical elements are effective literacy training methods, local educational practices, and army life; hence, the job must be a joint effort by American and native educational and military personnel. The end product should incorporate the latest findings of our own literacy training programs, along with the experience of native authorities in the field of adult education. Thus, the local Department of Education, as well as the Department of Defense, must support the program and provide assistance in the form of people and facilities. With such support, proper texts could be provided without delay. The same is true of the tests which are an essential part of any educational program of this type.

The implementation of the program is the responsibility of the native army and should eventually proceed without outside assistance. Of course, initially, the organization and operation would be in the pattern of the United States Armed Forces Education Program, adapted to the native military organization. Guidance and supervision could be provided by personnel from the United States Military Mission present in the country—we have missions working with the armies of most of our allies at the present time. There are, in our Army, military and civilian personnel fully qualified for this task, since we have conducted such a program from the beginning of World War II. Here—as in our own Army—the services of local civilian educators will be required to augment the administrators, teachers, and trainers in

uniform. Since prompt results may be needed to convince the skeptics, ample American support should be provided at the beginning. It should be understood, however, that the progress of the project will be gauged, in part, by the rapidity with which the native army develops complete self-sufficiency with regard to the entire program.

Concerning the time required to teach the native soldier the three Rs there need be no real concern. It should be remembered that the United States soldier who is illiterate is an exception. He has been surrounded with opportunities to learn to read and write, and has failed to take advantage of these opportunities. Therefore, he is, in general, either a very slow learner or else is indifferent to education—certainly he has never had any real desire to learn. On the other hand, there are millions in other lands who never had an opportunity to learn to read. Many of them are quite intelligent and can learn fast and, moreover, they have the desire to learn. Therefore, it is entirely conceivable that progress would be more rapid in the foreign armies than in our own; certainly there is no logical reason to expect it to be less rapid.

Would an oriental language involve so much more to learn that the time would be prohibitive? The answer is no. A well-known Chinese scholar, a friend of the author, estimates that the average soldier can be taught to read, write, and figure in about 4 months. And this is not too long, in fact it is about the length of time which we originally concluded would be necessary to bring an absolutely illiterate American up to fourth-grade level in the three Rs; therefore, this program is applicable to any area of the world.

Furthermore, it should be pointed out that during the period of literacy training, the soldier will be receiving instruction in those basic military skills which are manual and not dependent upon the ability to read and write. He will be taught drill, discipline, and housekeeping duties, and will be hardened physically through exercise in the form of calisthenics. The spirit of teamwork will be injected through supervised sports. Of course, this training represents progress in the development of the individual as a soldier; however, the schedule of subjects during the literacy training period should be so concentrated as to ensure the earliest possible accomplishment of the primary objective—*literacy*. Since every individual, and especially an adult illiterate, must have physical relief from mental effort periodically, the military subjects can serve this purpose and, at the same time, contribute toward the production of the ultimate goal—the effective soldier.

Secondary Education

The above discussion of the details of the program has centered on the literacy training phase, because it represents the most fundamental and most widespread effort. The succeeding steps, elementary, secondary, and vocational education, as well as technical training, are inherent parts of the over-all scheme, and must be prosecuted with equal vigor to ensure continuing development. The general principles outlined above are applicable here. Texts and tests should be constructed and military training and education blended into a program which will produce the noncommissioned officers and technicians for the anticipated units. Of course, the numbers and types of these units and their equipment should be realistic; they should be based on the present and anticipated skills—academic and vocational—of the native manpower. These can be determined with reasonable accuracy by means of tests. These tests should take into account practice, as well as theory; hence, the training facilities, such as shops, which can be made available.

Even equipped with literacy and the

fundamental mechanical techniques, the average soldier of an underdeveloped nation will not be able to employ the modern machines of war. The jeep is a relatively simple and rugged piece of equipment, but a poor driver can put it in the shop in short order. To get it out of the shop often requires the services of an experienced mechanic. It will take time to train drivers and mechanics in sufficient number to incorporate the jeep into the equipment of a native army. And it will take much more time to develop personnel to operate, maintain, and repair a cargo truck with an automatic shift. United States Army Missions in various countries have trained a selected few to handle our more complex equipment, but a few is not enough.

No army can raise itself very far above the manpower which comprises it. A nation fights like it lives; it cannot mobilize armed forces that require skills substantially different from those employed in everyday life by the average citizen. The horse cavalryman is not transformed into a tank mechanic by changing his cavalry troop into an armored unit. Actually, he becomes a bewildered, frustrated ex-cavalryman, and his unit—which could probably give a good account of itself on horseback—has been reduced to combat impotence with tanks which the men can neither operate nor maintain, much less supply and replace. It is true that any nation can scrape together a few technicians, enough perhaps to staff a regiment or even a division organized and equipped in the pattern of the United States Army 1954. This procedure is a snare and a delusion; there is no combat potential in such units. They look good in a parade and may be capable of limited riot duty, but they would disintegrate with the first echo of hostile gunfire.

Armies must have depth, mobility, and staying power. This means many men—men with weapons and equipment which they can operate and maintain—and men to replace these men. Thus, a nation must take as its mobilization base the weapons, equipment, organization, and operations which are within the capacity of the average citizen to master during a relatively short period of training. This is the only path to effective independent military strength for any nation; the leaders of the nation understand this. Certainly modernization in the sense of Americanization of various foreign armies can result in less, rather than more, efficiency. One hundred natives with strong backs and packboards can provide more logistical support than a 2½-ton truck which will not run. Perhaps, we should consider decreasing the number of trucks and increasing the number of packboards. This is certainly true for the underdeveloped peoples of the world—but it is not limited to them. Apparently, from the reports of late winter 1953, we sent to Indochina aircraft which not even the French could maintain. Thus, we were forced to send United States Air Force technicians into a combat area exposing them to enemy operations—and the risk of involvement in a new war.

Our mania for the modern and our assumption that the new is an improvement have resulted in questionable moves even within our own Armed Forces—although it is true that our manpower is, by far, the most mechanically and the most technically skilled in the world.

For example, the new 2½-ton truck with an automatic shift requires far more manpower and time to keep it running under combat conditions than the 2½-ton truck of World War II. On the other hand, it will carry no more cargo, nor is it faster than the older version. Thus, we have essentially increased the manpower necessary to support one frontline soldier. Some of our modern warplanes are so complex that their maintenance and repair require the services of relatively scarce civilian technicians.

Actually, it might be well for us as we balance weapons and skills for foreign armies to take a careful look at our own situation. Modernization, to the point of unattainable maintenance skills, cannot be accepted as progress. Even so the problem of complexity of equipment in the United States Armed Forces is a matter of relatively minute details. Whether or not the United States can afford this type of overspecialization is a question—it is a certainty that many of our allies cannot.

Local self-sufficiency is the best way for the free world to build up its strength in the fight against aggression. The ultimate aim is for nations to be strong within themselves, capable of combat operations without outside support. We have been providing equipment, organizing units, and furnishing technical assistance in the form of military missions. We have a considerable number of units to show for this effort—divisions, regiments, and battalions in various parts of the world. However, there is, in the case of these units, the necessity for continued technical support from us. This has two real disadvantages; they are incapable of independent action, and they impose a continual drain upon our own manpower. From our viewpoint and that of the entire free world, progress should be measured not by the number of natives in uniform nor by the number of divisions in the army, but rather by the number of self-sufficient units which can take the field.

The Future

Our aim should be to produce combat power without American technical support; this is something that we have not been able to achieve, to any great extent, up to the present time. This is one area in which the Soviets have outstripped us—they made a more realistic appraisal of the military capabilities of the manpower available than we did. We have had several South Korean divisions at the front; however, an enormous number of United States Army personnel still would be needed in Korea to assure combat durability. Large numbers of United States technicians are involved in the maintenance, operation, and distribution of weapons and equipment which are too complex for the Korean soldier. On the other hand, it is apparent that the North Korean and the Chinese can be relatively self-sufficient on the battlefield, because we have not detected the presence of large numbers of foreign supporting personnel operating with the Communist armies.

As we develop educational and vocational proficiency in the army, we raise the civilian capacity to industrialize. The knowledge and skills acquired by the soldiers will be available to the nation when these soldiers become civilians, and the techniques which they have learned in the army can be applied to peaceful pursuits. For example, those trained as motor sergeants provide a source of "factory-trained mechanics" for commercial trucks and milking machines. Moreover, the literacy and further academic education generate momentum for more study on the part of the ex-soldier, his family, and associates. The seeds of progress have been sown on a wide expanse of fertile ground. They will take root and produce, not an isolated patch of fragile sprouts, but a nationwide field of robust saplings which can be nurtured into a durable forest. The foundation for political and economic, as well as military, strength has been laid and can be built upon with genuine assurance.

MOVING?

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THE HAMMELBURG MISSION

Captain Martin Blumenson, *Adjutant General's Corps*
Office, Chief of Military History, Department of the Army

The setting of the Hammelburg Mission may be found in THE LAST OFFENSIVE, a volume being prepared by Major Fred J. Meyer, Office of the Chief of Military History, Department of the Army, who made the material available to the author.

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

ON A DARK night in March 1945, as World War II was drawing to a close in Europe, 307 American soldiers of General George S. Patton's Third Army departed on a strange mission. This group of American soldiers drove 50 miles into German territory and vanished.

Men in the European Theater heard vague rumors of the mission. Whispers passed from one soldier to another, but only a few knew what had happened.

Officially the story has never been told. All references to it have virtually disappeared from the record. Only a few entries remain in the voluminous battle journals of the forces involved. General Patton mentioned it in his memoirs to show that the mission failed because he accepted unsound advice from subordinates. The volume written by Robert S. Allen—a member of Patton's staff—contains only one allusion to the incident.

How do we know what happened then during this secret mission? We know because combat historians interviewed survivors shortly after the event and left us a detailed account. Later, when we captured the German records, we learned more.

Toward the end of March 1945, Patton's Third Army was through the Siegfried Line and just across the Rhine River. An armored division had driven 30 miles east of the Rhine and taken Aschaffenburg. From there, Patton was to turn his Army to the north. Capture of a bridge at Aschaffenburg, however, presented Patton with an opportunity to make an armored penetration to the east. (See Figure 1.)

Deception is a cardinal principle of warfare. Like a good boxer or halfback, a good general knows the value of a well-executed feint. An armored feint to the east would deceive the Germans. It would disguise Patton's real intention to go north.

East of Aschaffenburg—50 miles—lay Hammelburg, where the Germans had a prisoner of war camp. Approximately 1,000 American officers were imprisoned there. A force sent to Hammelburg would liberate them—rescue some from starvation and death—and bring medical care to the sick and the wounded.

The mission was dangerous. Sending a small force 50 miles into enemy-held territory invited disaster. It would be comparatively easy for the Germans to cut off the force; surround and destroy it before the main body of American troops could advance and rescue it.

Patton intended to send a combat command of an armored division to Hammelburg. A force of 3,500 men—he reasoned—would be able to take care of itself if

encircled and isolated. Subordinate commanders apparently doubted the advisability of the mission. However, because Patton was determined, they tried to dissuade him from jeopardizing such a large force. Since it was to be a hit-and-run affair, they argued that a smaller group had a better chance of success. Fewer vehicles meant quicker movement. Against his better judgment, Patton let himself be convinced they were right.

The combat command originally selected for the Hammelburg mission formed a task force of 307 men in 54 vehicles—10 *Sherman* tanks, 6 light tanks, 27 half tracks, 3 assault guns on tracked carriages, 7 jeeps, and 1 tracked cargo carrier. The force was placed under the command of a lieutenant colonel. However, because this officer was to undergo medical treatment for a minor ailment, the task force was turned over to Captain Abraham J. Baum.

Baum's mission was to take the most direct route to the prisoner of war camp at Hammelburg. He was to load his vehicles with liberated officers and return to Aschaffenburg. The remainder of the freed men were to walk along beside the vehicles or move cross country in small groups to the American lines.

Just before the task force departed, an aide-de-camp of General Patton—Major Alexander C. Stiller—appeared and requested permission to accompany the expedition. Baum invited him to ride in his command tank.

Stiller's appearance seemed to give weight to gossip that later circulated through the European Theater. It so happened that one of the prisoners at Hammelburg was Lieutenant Colonel John K. Waters—General Patton's son-in-law. Rumor-mongers maliciously whispered afterward that Patton desired to liberate Hammelburg in order to rescue Waters. Stiller unconsciously abetted the rumors for he had explained to Baum that he wanted to accompany the task force "for the thrills and laughs"—a lame excuse, obviously not plausible, patently false. Stiller's real reason for volunteering—a reason that Baum appreciated and respected—was the realization that Patton could not help but have a normal personal interest in the outcome of the mission—an interest quite apart from the military aspects of the operation. Stiller's offer to go along with Baum was a creditable and courageous act that emerged as a natural result of his devotion to his chief.

The task force got underway shortly after midnight. The vehicles passed swiftly through the towns of Stras-Bessenbach, Keilburg, Frohenhofen, Laufach, and Hain with little trouble. (See Figure 2.) A few German riflemen and bazooka operators in the towns caused several casualties, but Baum did not halt. Surprised enemy garrisons failed to man the artillery pieces that occasionally covered the road.

Beyond Hain, the vehicles entered the silence of a dense wood where the sound of the tank motors and the clank of the tank treads seemed as eerie as clashing cymbals in a deserted theater. But even more significant was the absence of Germans. For the first time since he had learned of his mission, Baum began to feel that he might succeed.

In the town of Lohr, the task force met a German tank unit moving toward the front. Before the Germans became aware

An account of a small task force—307 men from the United States Third Army—which knifed deep into enemy territory and for a brief period played havoc with German military plans, equipment, and morale

of the Americans, Baum's men opened fire and destroyed 12 enemy vehicles. One American tank was lost, but the task force had kept moving as the men fired, and the vehicles burst through the village and continued.

On the outskirts of Lohr, the men noticed an antiaircraft train that carried multibarreled guns set in concrete. Baum stopped long enough to destroy the locomotive and to disable most of the guns with thermite grenades.

Just before dawn, as the task force entered Gemünden, the men saw a dozen trains with steam up; each train was composed of about 20 cars. They did not know that the trains were preparing to load and transport a nearby German division to the battle zone. But as they passed, Baum's tankers fired and destroyed about half of the engines.

There was an important bridge in Gemünden. When the lead tank in Baum's column rolled toward it, a German security guard destroyed the structure by exploding previously prepared demolition charges. A wide detour thus became necessary. Baum halted and questioned the few prisoners his men had taken. He selected as a guide a German who seemed familiar with the region. The prisoner took the task force 6 miles north to Burgsinn. There the force crossed a tributary of the Main River, then followed a rugged trail over a steep ridge toward a second tributary.

In the meantime, the Germans were making frantic efforts to stop Baum. General Von Obstfelder, the army commander opposing Patton, was cursing his adversary for having correctly diagnosed a German weak spot. His headquarters had almost been overrun near Lohr. His units were scattered, and he could not rally a counterforce at once. His greatest worry was that the small task force might not be alone, that it might be really the spearhead of a larger force that was following.

Ignorant that his advance was bringing consternation as far distant as Berlin, Baum continued. In mid-morning, the task force swept into Grafendorf, overran a German prisoner of war camp, and liberated 700 Russians who immediately raided the town and broke into liquor warehouses and food dumps in a wild frenzy of joy. Baum turned over to them the 200 German prisoners he had collected, and he prepared for the last dash to Hammelburg, less than 7 miles to the east.

Close to noontime, the armored column approached the town of Hammelburg. The men noticed a small German plane cruising lazily overhead. They drove it off with machinegun fire. But the German pilot had verified the size and the location of Baum's force. He notified the German High Command.

By "mere coincidence"—as the Germans later admitted—a German assault gun battalion was also entering Hammelburg. Traveling from the Soviet front and moving toward the Americans, it arrived in town at the same time as Baum's task force. A firefight took place which lasted for more than 2 hours. The Americans lost 3 *Shermans*, 5 half tracks, and 3 jeeps. Baum's men destroyed 3 German guns and 3 ammunition carriers. They also broke through the town and through the German force.

Continuing, they drove to the prison camp a scant 2 miles away. Intimidating the guards, Baum's tanks broke into the camp by pushing through the barbed wire

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Captain Martin Blumenson served as a combat historian with the Third and Seventh Armies in Europe during World War II. He was an instructor in history at the United States Merchant Marine Academy, Kings Point, New York, and at Hofstra College, Hempstead, New York. He was recalled to active duty in 1950, and subsequently sent to Korea where he commanded the 3d Historical Detachment. Since 1952, he has been assigned to the Office, Chief of Military History, Department of the Army.

inclosure that surrounded the central compound.

The prison commandant, prodded by his prisoners, immediately came forward to surrender. A few obstinate SS guards opened fire and seriously wounded Waters. Baum's men quickly overcame this resistance and liberated the camp. The enthusiasm of the freed prisoners was so great that several hours passed before Baum could restore order.

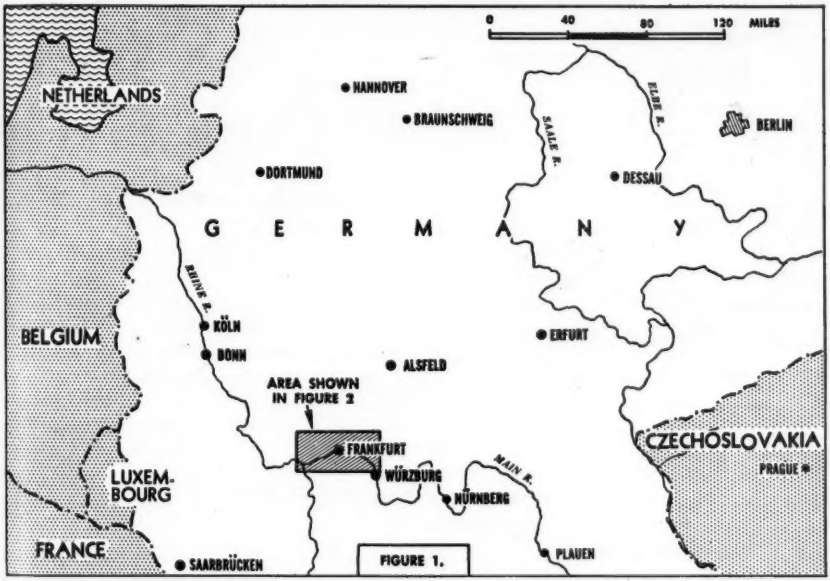


FIGURE 1.

The enemy was not idle during this time, especially in the town of Hammelburg. When the commander of the gun battalion seemed uncertain about what he ought to do, a German officer—on leave and spending his vacation in town—resolved his problems by assuming command. He was persuaded that Baum would have to return to the American lines; therefore, Baum had logically to come back through Hammelburg. An ambush was in order.

In the Hammelburg camp, Baum discovered close to 5,000 Allied prisoners, of whom almost 1,500 were American officers. Loading as many Americans as possible on his tanks and personnel carriers, and accompanied by those who could walk alongside, he began his return trip to Aschaffenburg. The wild enthusiasm that had greeted the task force had subsided. Those who left the shadows of the inclosure wall moved soberly, conscious of the dangers which still stood between them and freedom.

They did not go far. Scarcely 50 yards from the camp, a sharp flat report sounded; one shell knocked out the lead tank. The German assault gun battalion lay in wait in the town of Hammelburg.

Hope of taking the prisoners back vanished. Most of the men returned silently to the camp. Baum's force, with 65 liberated American officers who chose to accompany it, turned to the southwest to avoid ambush and drove toward Hessdorf, 5 miles away. It was late in the evening,

and Baum hoped he could evade discovery by German counterforces during the night.

At Hessdorf—close to midnight—Baum turned north. One of his tormenting problems was finding bridges or crossings over the tributaries of the Main River. Less than 2 miles from Hessdorf, the vehicles struck an enemy roadblock. German soldiers manning antitank guns knocked out three of Baum's tanks and inflicted severe casualties on his personnel.

Baum pulled his force back to a hill where he took stock of his situation. He had slightly over 100 men and about 60 liberated officers. He had 3 *Sherman* tanks, 6 light tanks, and 12 half tracks. He was dangerously short of gas. He had only a few hours before daylight to make good his escape. If he got his men through the German roadblock, he still had about 45 miles to go to reach the American lines.

He directed his men to siphon the gas from the half tracks and divide it among the tanks. After the gas was drained, the half tracks were set afire. He placed his wounded in a building on the hill, and marked it with a Red Cross. After giving his men a brief talk, he led them down the hill to attempt to break through the German roadblock.

As soon as they had started, the men knew it was hopeless. Day was breaking, and the column was surrounded. Two companies of enemy infantry supported by tanks advanced from the southeast. Self-propelled guns fired from the south. Antitank guns threatened from the northeast. Six large tanks blocked the route leading north. An armored column approached from the northeast.

Enemy shells soon destroyed all of the task force vehicles. With his tanks gone and the Germans closing in, Captain Baum held a final conference. He instructed the members of his command to form into groups of three and four and attempt to filter through the Germans to safety. Wish-

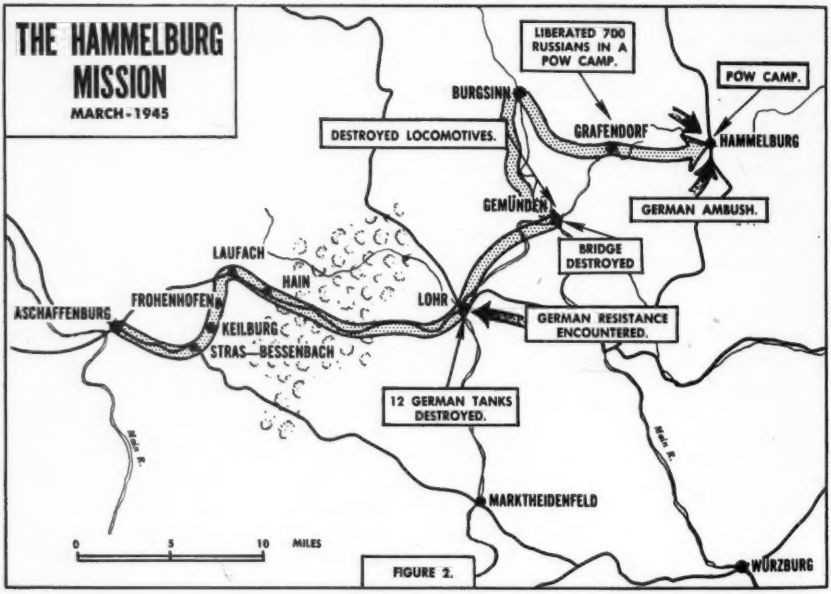


FIGURE 2.

ing them luck, he then dismissed them.

Some managed to escape. Baum was not so lucky. With Major Stiller and a lieutenant, he moved off the hill on foot. They heard the baying of bloodhounds—dogs from the Hammelburg camp that the Germans were using to track down the task force survivors. Before they reached the bottom of the hill, Baum's party was taken prisoner by a German patrol. An enemy soldier shot Baum in the leg and gave him his third wound of the operation.

That evening American airplane pilots saw a convoy of vehicles near Hammelburg. A large white sheet displayed the letters "USPWS"—United States Prisoners of War. The Hammelburg mission was over.

It had come close to achieving its purpose. Despite failure, the Hammelburg task force had accomplished much. It had disrupted the entire Aschaffenburg—Hammelburg sector. It had damaged military trains, destroyed antiaircraft guns, deranged troop schedules, disabled assault gun units, and provoked general uncertainty and confusion. Who knows what trouble the Germans had with 700 liberated and intoxicated Russians near Grafendorf?

In addition, the task force caused the Germans to draw additional forces to the Hammelburg area—thereby making Patton's feint successful. The effect of sending the task force deep into German territory weakened further the deteriorating German morale. The action disclosed to the German High Command the woeful inadequacy of the defenses east of Aschaffenburg and it also underlined the futility of trying to deceive Patton by maintaining a semblance of resistance.

Unwilling to admit that such a small force had brought such consternation, the Germans reported destroying 13 of 50 American tanks and driving the remainder back to the west. A propaganda broadcast boasted that German forces had obliterated an entire American armored division near Hammelburg.

Little more than a week later, Patton's Third Army re-took the town and liberated the prisoners. By then, the Allies were driving recklessly forward to overrun the last scattered enemy resistance. With the end of the war in sight, the Hammelburg mission was virtually forgotten. As a typical Patton maneuver—a cavalry action combining audacity and a willingness to gamble—it deserves to be remembered.

The factors bearing on grand strategy are constantly changing with the changing fortunes and trends of nations; strategic conclusions must be periodically reviewed. Therefore, strategy itself is a fluid thing, shifting under the influence of timely circumstances. The principles of war (the implementation of strategy) are constant, but strategy itself changes.

Admiral Robert B. Carney

ARMY MEDICAL LABORATORY FIGHTS TROPICAL KILLERS

Information Office, Headquarters, USARFANT & MDPR

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THE United States Army engages in warfare not only on battlefields, but also in stranger, more desirable, surroundings. A great battle against disease is being fought in an atmosphere of palm trees and tropical breezes along the northern coast of a Caribbean island.

The Surgeon General has within his command a Tropical Research Medical Laboratory, located in San Juan, Puerto Rico, which has been "established for the purpose of conducting tropical medical research unencumbered by additional secondary missions." The laboratory's efforts point toward conserving fighting strength. The first aim is to prevent a disease; if prevention fails, the next aim is early diagnosis and effective treatment so that the soldier can be rapidly returned to his unit. The laboratory's interest in routine problems is based on their pertinence to the worldwide picture.

Diseases such as schistosomiasis and tropical sprue, although unfamiliar to the average person, are common in areas in tropic and subtropic zones. Close to the latitude of Puerto Rico are vital areas such as Indochina, Formosa, India, Arabia, and North Africa. All of the diseases being studied in the laboratory exist in Puerto Rico. The Army's investigation of these diseases, therefore, has a dual purpose. Successfully completed research can prove to be lifesavers in such regions which might be considered as potential battlefields.

The need for research on exotic diseases was realized as recently as the Spanish-American War. During the occupation of Puerto Rico in 1898, three American soldiers were killed in combat, while 700 died from disease. Disease was a bigger hindrance than the engineering problems encountered during the construction of the Panama Canal.

During the second World War, over 1,000 cases of tropical sprue were reported in a 3-year period among the Italian war prisoners in a concentration camp in India. Hundreds of cases of this disease among British troops in Hong Kong have also been reported in the past few years and are now being studied at the laboratory in San Juan.

Diseases studied can be divided into three categories: those caused by parasites, such as schistosomiasis; those caused by bacteria, such as typhoid; and viruses, such as influenza. In general, research attempts to learn more about the relationship between the parasite and its carrier, to discover the part immunity plays, and to investigate the effectiveness of shots. However, not all tropical diseases are attributable to known "bugs."

One of the diseases of considerable importance for which no known cause has been discovered is tropical sprue.

Schistosomiasis, usually shortened to "schisto," is present in Puerto Rico, the Philippines, Indochina, and Indonesia, and attacks hundreds of people in other countries of tropic zones. Schisto is one of the infectious diseases which is being stressed in research. The deadly schisto parasite is carried by a snail. Malacologists—zoologists concerned with snails and other mollusks—are studying characteristics of water collections to learn why schisto snails thrive in some bodies of water and not in others. The possibility of eliminating the disease by destroying the snails is being investigated.

Schisto snails are found only in fresh water. Upon contact with the body, the parasite leaves the snail and burrows into human flesh where it thrives. Parasitologists are studying the life cycle of the schisto parasite and the serology section prepares solutions for diagnosing infection by skin tests or by testing the patient's blood.

Tropical sprue, proportionally less malignant than schisto, is quite prevalent in Puerto Rico, as well as in Egypt, southern China, Burma, and other tropical countries. This disease hinders absorption within the human system. Although a person may be healthy in appearance, he may have the disease in its early stages.

If the amount of food which is absorbed and which is eliminated from a normal person has been determined, a comparison is then made with the quantity absorbed and eliminated by a tropical sprue-infected person. Bacteriological studies on tropical sprue are also being conducted. Research is being carried on with typhoid fever, amebiasis, leptospirosis, and influenza, among other diseases.

The Army is generous in encouraging the use of its facilities by qualified personnel. Scientists from universities in the United States occasionally are invited to come to the laboratory to perform research supplementing their studies in their own schools. There is similar cooperation with the School of Medicine of the University of Puerto Rico in San Juan.

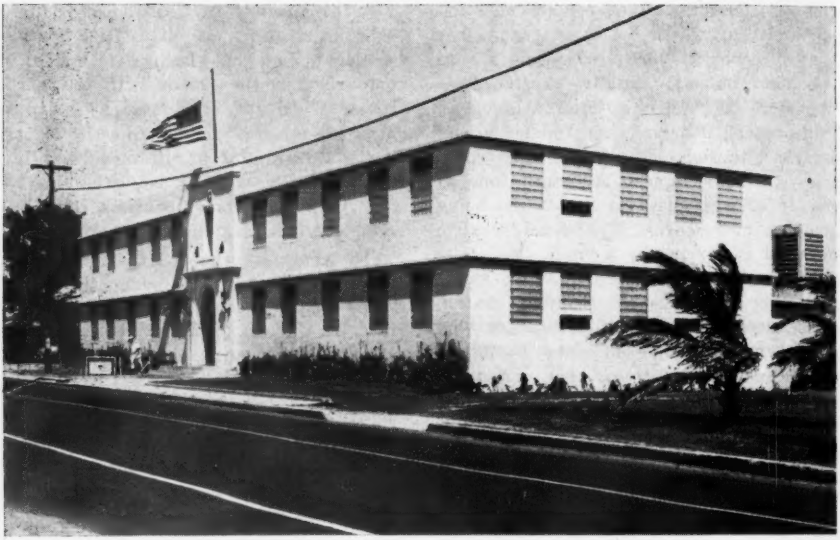
Since the laboratory is the only such establishment directly under the command of The Surgeon General in Washington, D. C., it is not actually within the local command. However, there is mutual cooperation between it and Rodriguez Army Hospital, both of which are located at Fort Brooke, and other installations of the United States Army Forces Antilles and Military District of Puerto Rico.

The working staff of the United States Army Tropical Research Medical Laboratory has an unusually high educational level. At present, there are 17 enlisted

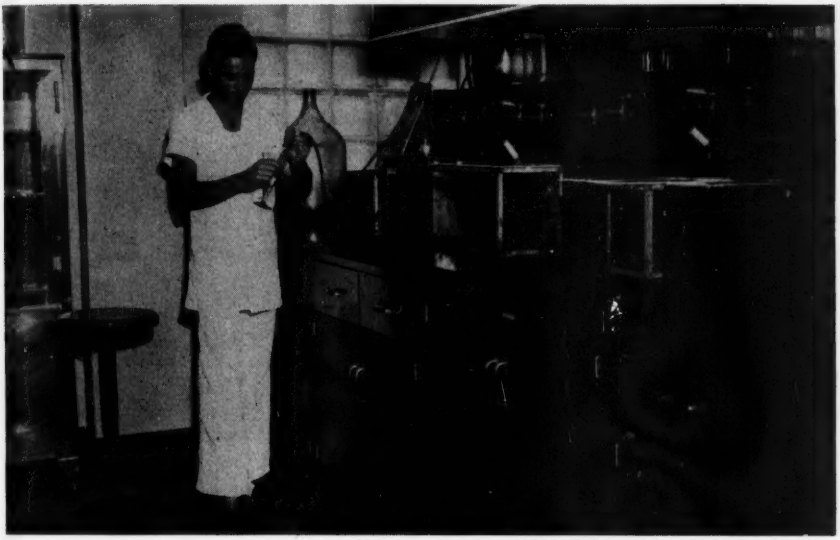
Established for the purpose of conducting tropical medical research unencumbered by additional secondary missions, the Army's Tropical Research Medical Laboratory is waging a great battle against disease

In present experimentations, absorption is traced in persons suspected of having the disease by foods which are "labeled." This is accomplished by the addition into the foods of small quantities of a radioactive isotope which allows it to be traced through the body.

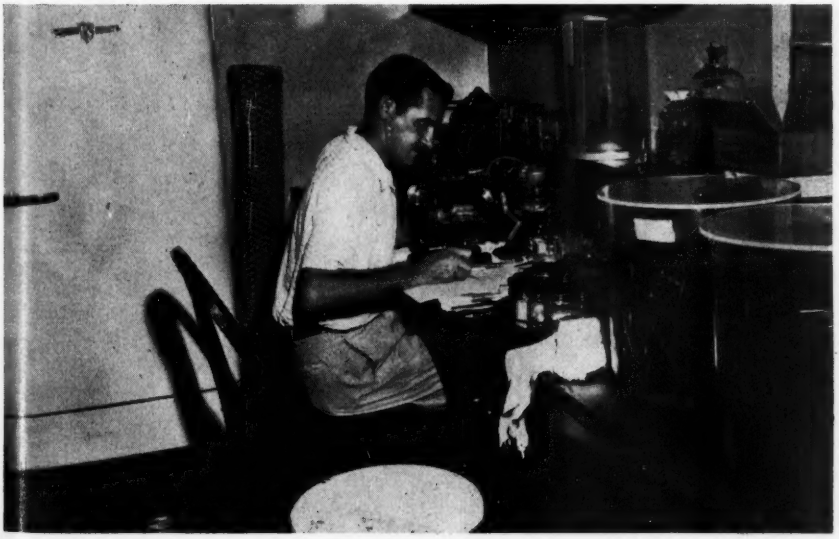
personnel, 6 officers, and 17 civilians working at the laboratory. Their work is an integral part of the entire pattern of tropical disease research, just as the work being done by the laboratory integrates into a universal struggle to eliminate disease.



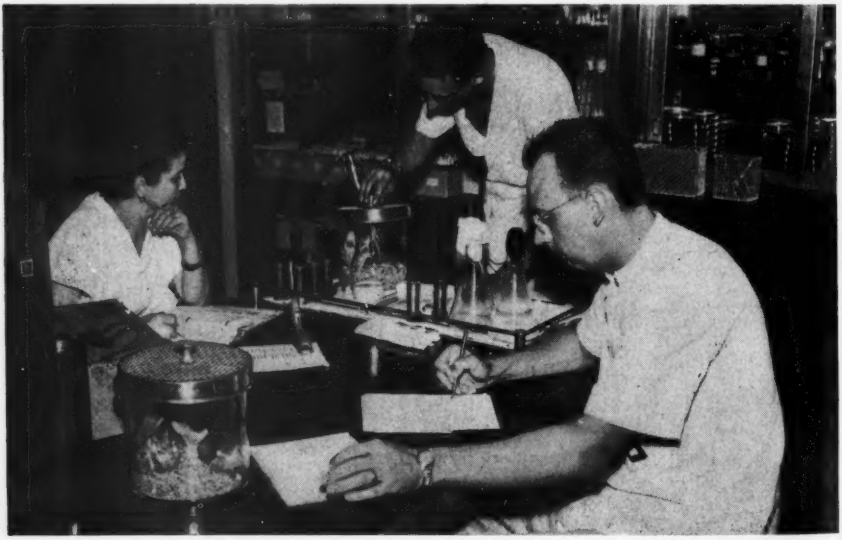
The Surgeon General has within his command a Tropical Research Medical Laboratory located in San Juan, Puerto Rico. Above, the Army's laboratory where tropical diseases are studied in their native habitats. Below, staff members engaged in research on schistosomiasis, a disease present in Puerto Rico.—Department of Defense photos.

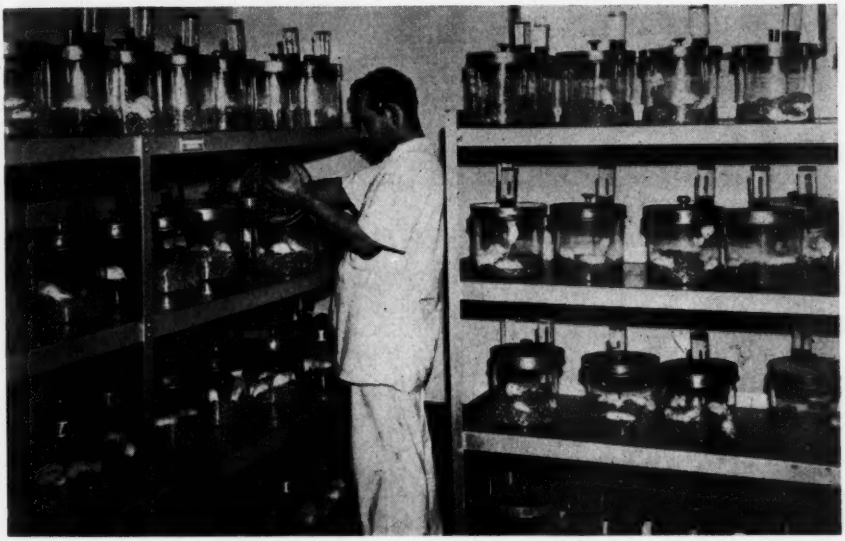


The characteristics of water collections are studied to learn why schisto snails thrive in some bodies of water and not in others. Above, a staff member siphoning water which has been collected for research. Below, a civilian doctor recording data gleaned from studying snails in large jars at right.—Department of Defense photos.

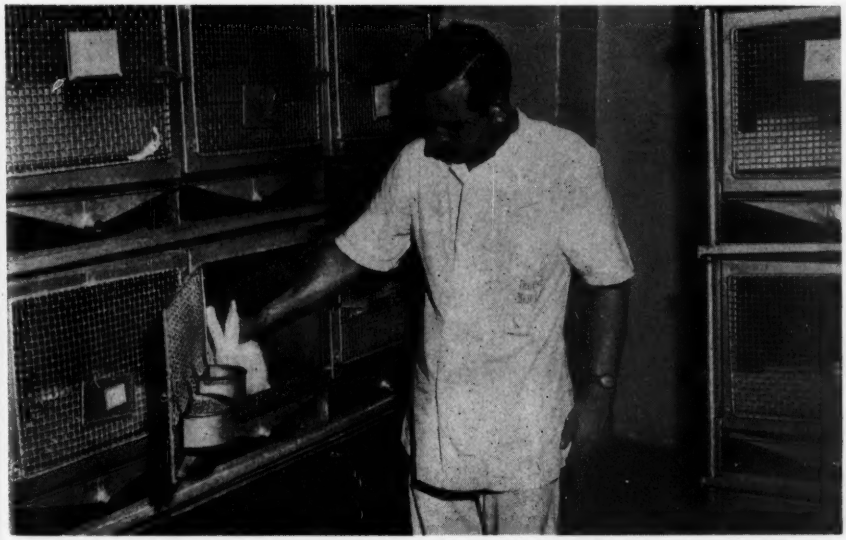


Diseases such as schistosomiasis and tropical sprue are common in areas in tropic and subtropic zones. Above, an enlisted technician calculating absorption rates in a specially dehumidified room used for work on tropical sprue. Below, technicians studying hamsters used in bacteriological research.—Department of Defense photos.

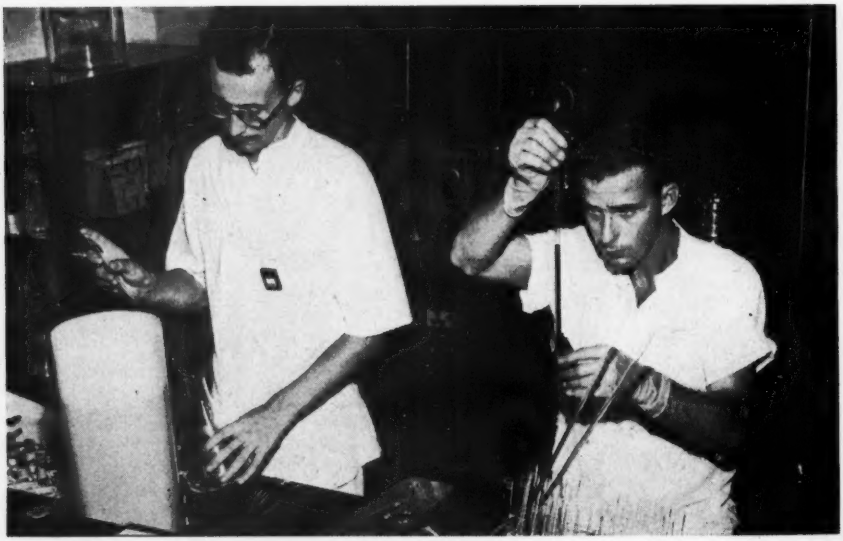




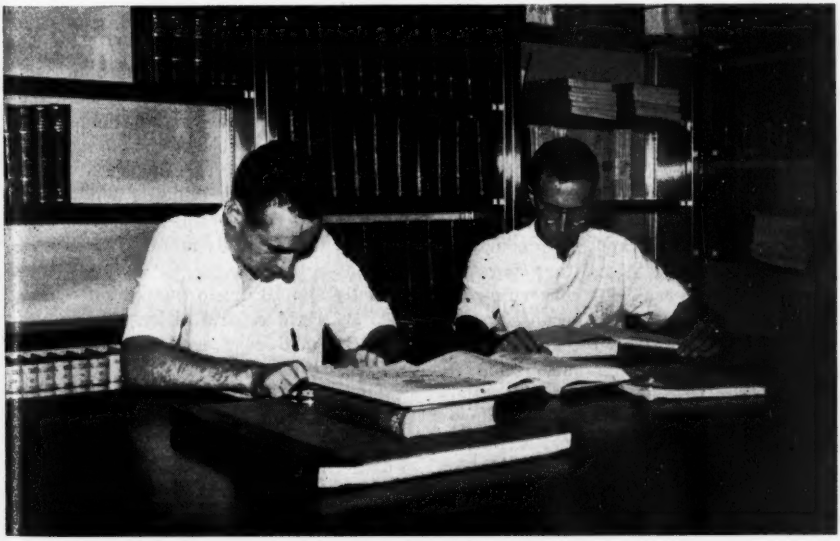
Diseases which are being studied at the laboratory can be divided into three categories: those caused by parasites, bacteria, and viruses. Above, a civilian technician inspecting a litter of mice used in research. Below, a civilian employee examining a rabbit in the miniature "zoo" which adjoins the laboratory.—Department of Defense photos.



Radioisotopes are used to "label" foods consumed by persons suspected of having tropical sprue. Above, technician (left) holding a Geiger counter, while man (right) removes radioisotope from its lead container. Below, technicians working on radioactive blood samples being used in research on the project.—Department of Defense photos.



A knowledge of what has been accomplished in the field of tropical medical research is necessary for the successful advancement of research. Above, the chief serologist checking some findings with his assistant. Below, staff members studying at the library of the Tropical Research Medical Laboratory.—Department of Defense photos.



KNOW YOUR DARK HORSE

Brigadier General Charles E. Hoy, *United States Army*
Commanding General, Tactical Command, United States Forces in Austria

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IN ANY competition of warfare, it is always to your advantage to know what you are up against. *Know your enemy.*

Since the conclusion of World War II, the peoples of the earth have seen the emergence of two great powers with two entirely opposite ways of life. At first, we, who represent the democratic ideals in this divided world, were prone to dismiss the threat of communism much too lightly. To be sure, we were suspicious of our then ally, but our suspicions were voiced in whispers only. As the years passed, however, our suspicions have been confirmed until, today, we need not hesitate to recognize our enemy.

The Communists have, in a few years, taken over the governments of 11 countries in Europe and Asia, not by military conquest, but by revolutionary tactics of subversion, propaganda, and infiltration. The only military heroes of the past who have approached this record are Genghis Khan and Napoleon, and their conquests were made entirely by military force.

Now, we can speak out concerning the enemy and his aims. It is because we understand the enemy and recognize his objective toward world domination that we dare call him by name. Today's frontiers for the defense of freedom are no longer bounded by specific mountains, oceans, or countries. The struggle is global. The frontier is the minds of men and their will to be free.

Although we recognize the enemy, I am not sure that we know him. It is often said that we must not underestimate the opponent. To me, that means simply that we must learn all there is to know about the foe if we are to evaluate properly his capabilities and limitations. In other words, I am convinced that too many of us think of the Communists as "nincompoops" and incapable of any great movement against us, which we might elect to oppose. I believe that in this we are making a great mistake.

The Soviets have proved their ability to succeed in nonmilitary aggressions. We have seen them make progress in air development and we are told that they are only a few months behind us in the development of the hydrogen bomb. Why then should we reason that their military development is no less assured?

To pursue the idea of military development in the Soviet Union, I should like to discuss her World War II armies as a basis to give a clearer idea of her Army today. Early in the war, the Soviets were faced with the problems of holding off the enemy from their vital industrial centers and, while doing so, building a new army. They solved their problems in four ways:

1. By using simply manufactured weapons.
2. By simplifying organization.
3. By rigid centralization of command.
4. By lend-lease equipment from the United States.

That their solution was fairly effective is indicated in the fact that they were able to tie down most of the German divisions. Furthermore, they became stronger as the Germans weakened to the extent that they could move fresh divisions through de-

pleted ones and pick up their support elements—an action which requires considerable co-ordination. Naturally, their actions were not the approved Command and General Staff College solution. Most of the time they were ragged, but they were successful.

Yet, one example might suffice to furnish a clue to the possibilities of what results the course of development may have brought about in 10 years. In the spring of 1944, the Soviets moved a half million troops—in less than 60 days—from the Crimea, 600 miles north to Belorussia, cutting at right angles across the axis of communication of four army groups in active combat. Such an operation definitely required a very high order of planning and movement control.

To be sure, this is but an example—and an isolated one at that. However, I do not feel that we can overlook the potentialities of an enemy whose Army, in its infancy, in 1944, could accomplish this amazing feat. Since the war, there is much evidence to lead to the conviction that the Soviets have profited immeasurably from the lessons learned during the last war.

Organization and composition have changed radically, resulting in a very material increase in the effectiveness of the Soviet forces. I will not subject you to all the details of their divisional organization. A few points will, I think, be sufficient to suggest improvements in the various types of divisions. The rifle division, for instance, has been made over into a balanced unit. The assigned artillery has been nearly doubled and organic tanks added. Its logistical endurance has been increased by adding more special troops.

The mechanized division is the largest of the Soviet divisions. This is the Soviet solution to the problem of achieving good balance and interplay between infantry, artillery, and armor. It has an abundance of tanks and nearly as much infantry as the rifle division.

Concerning the present status of the airborne division, little information is available. We do know that prior to World War II, the Soviets led the world in the development of airborne forces. Their reluctance to produce suitable air transports has rendered them ineffective in the airborne arena. Nevertheless, it is probably unwise to presume that their solution is not shrouded in military secrecy.

Training since the war has occupied the attention of the Soviets to a great degree. It is believed, for instance, that most officers have spent a good half of their time in schools since the end of the war. Meanwhile, their Army has instituted a system of officer training which will begin to shape young boys in cadet schools at the age of 11 or 12, and produce, presumably, first-rate junior officers on graduation from officer candidate school some 8 or 9 years later. At the same time, the Soviet Army conducts a prescribed cycle of field exercises and maneuvers each year.

The rugged life so common to existence in the Soviet Union quite naturally carried over into her Army. For all troops, daily training is long and meticulous, and includes much time spent in training in below zero weather and at night. Even the leisure time of Soviet troops is occupied with lectures in Marxian doctrine. Every indication points to effective and well-trained organizations, capable of making good use of the mechanized equipment and keeping it in good order.

Today's frontiers for the defense of freedom are no longer bounded by specific mountains, oceans, countries, or rivers—the struggle is global. The frontier today is the minds of men and their will to be free

There is no doubt that the tough daily life of the Russian people has carried over into the Army. It was noted that during the war, their supply discipline was in some respects probably better than ours. Of course, much of this discipline was brought about because of the severity of punishment inflicted for loss or misuse of equipment. At the same time, we must credit a large part of their discipline to the fact that the Soviet soldier was not accustomed to the generous scale of supply which prevails in the United States Army. True, there was waste through ignorance, but much of this, undoubtedly, has been corrected.

Much has been said about the lack of know-how on the part of the Soviets to produce effective weapons. Here, again, I feel we have failed to estimate the capacity of our enemy. We believe that there is sufficient evidence to support the contention that the Soviet Army is now equipped with modern weapons, generally on a par with ours. Even more startling is the possibility that it has more, and that if we were to destroy the munitions industry, the present Army could fight for about 1 year with the weapons and equipment now on hand.

I feel that in still another area we have based our thinking on faulty assumptions. That is their supply capacity. Generally, it has been advanced that the Soviets' lines of communication would be so extended that they would bog down logistically. Even in World War II, there was evidence to refute this conclusion. Based upon five operations made by American, British, and Soviet forces, the Soviets were able to move very substantial forces at highly sustained rates of advance for several weeks. In fact, during the exploitation phase following a breakthrough, Soviet advances were on the same order as those of General Patton in France, and at comparable daily rates of movements—this despite the fact that they were on the verge of defeat during the first 4 months of the war. We can well assume that the 10 years following the war have been spent in improvement, and that forward areas have been well stockpiled.

There must be a change of thought also in connection with the Soviet soldier. Too often, the Soviet soldier has been pictured as stupid and ineffective. On the contrary, the Soviet soldier must be considered a first-rate fighting man who is brave, tough, resourceful, and obedient. True, there are certain weaknesses in him—such as lack of initiative, independent judgment, and technical knowledge—to offset his good points.

During World War II, the Soviet soldier demonstrated exceptional ability in deception, camouflage, and successful utilization of the crudest types of cover. In one instance, an entire Soviet tank army—about 800 tanks—hid itself so effectively as to remain completely lost to air reconnaissance for more than a week.

Even during temporary pauses, the Soviet soldier digs in. Because of his rugged life, he is especially immune to hardship, suffering, and the thought of death. Being used to hard work, he is strong of back and legs. We believe that he can subsist even on grass and whatever else the land affords, and that he considers anything above that as a luxury.

The Soviet soldier is a skillful woodsman and infiltrator; he is tough and used

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Brigadier General Charles E. Hoy is a graduate of the Command and General Staff College and the National War College. During World War II, he served as Army Amphibious Advisor to the Commander in Chief, United States Fleet, and commanded the 334th Regiment, 84th Infantry Division in Europe. In 1949, he was assigned to the Joint Intelligence Group, Office of the Joint Chiefs of Staff. In 1952, he went to Austria and served in the G2 Section, Headquarters, United States Forces, and is presently the Commanding General of Tactical Command, Austria.

to privation and, at the same time, shrewd, energetic, and clever. He is superb in his physical condition, having been subjected to training in the most difficult terrain and during periods of adverse weather.

Perhaps the Soviet soldier is also the answer as to whether, in a war, we will have the advantage of ideological dissatisfaction in our favor. We must realize that the Soviet soldier has grown up in a communistic society and knows little, if anything, of any other way of life. The evidence supports the statement that the number of Soviet defectors deserting for ideological reasons has been insignificant. The doctrine imposed by most dictatorships on an intelligent people for short periods of time are usually challenged and eradicated; however, the Soviets have had over 30 years to imprint their ideologies on a people basically ignorant. Practically all knowledge to the Russian people has been in terms of communistic doctrine with outside influence obliterated by rigid counterintelligence measures.

One authority has stated that the Soviet soldier will fight because he believes his cause is just. The average Russian believes his Government is right and that the harsh governmental steps taken are necessary to carry out the great plan. The Soviet tactical doctrine is much the same as ours. The primary difference is in application—the Soviets use masses of infantry, masses of tanks, and massed firepower. It must be assumed that the introduction of atomic warfare has altered their principle of mass. Surely, they are fully aware that the continued use of mass would provide a highly remunerative target for atomic weapons. Without a doubt, they have changed their tactical doctrine accordingly.

The Soviets have also made great strides in airpower. It has been established that the *MiG-15* is one of the best jet fighters in the world. The Soviets have an up-to-date Air Force which is capable of affording their Army close, tactical air support.

All of what I have said sums up to the fact that the Soviet Armed Forces will certainly be no pushover in war. As a result of indoctrination, training, and increased effectiveness since the war, all indications lead to the conclusion that they are capable of employing chemical, biological, and radiological warfare, making effective use of jets and bombers, and utilizing masses of men, tanks, and firepower. We must credit to them the technical developments to produce wartime munitions, such as radar, atomic and thermonuclear weapons, and guided missiles. We must also credit them with well-trained armies of tough, able soldiers who are at their best under pressure.

I have recounted all the above observations concerning the Soviet Army, not as a means of creating consternation, but to arouse the proper degree of respect for an able enemy. It is false to speculate on the Soviet shortcomings as a basis for winning any global conflict. I feel that now, more than ever, the truth of the situation, insofar as we can discover and use it to our advantage, is the light that will assist us in defeating the Soviets.

It is in this light that we should gear our training to overcome an able enemy. If the enemy is tough—we must be tougher—we still have a short lead in technical know-how, but we cannot become complacent—we must continue to lead. We must seek continually the means to pierce the weakness of our enemy.

We must all share the responsibility to see that everyone—and especially our soldiers—are fully aware that should we find ourselves at war with the Soviets, we will be facing a daring, ruthless, and cunning foe. We hope that such a war may never come, but, we must not for a moment lull ourselves by such hopes to inactivity in our preparation for the successful pursuit of war should it come.

The Soviet Partisan Movement

First Lieutenant Larry L. Wolff, *Infantry*
Adjutant, 482d Field Artillery Battalion, Henry Barracks, Puerto Rico

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IT IS NOT the intention of this article to present a solution to a military problem of vast consequence, since its implications are so manifold and many of its facets as yet unknown to the average commander so that unfortunately only actual experience will teach him how to cope with it. However, foresight is better than hindsight and by understanding the problem and by studying the effect it may have on over-all military operations—and we will only deal with its military aspects—much can be gained. Many doctrines—until now accepted as important measures to gain tactical advantages over an enemy—must be totally revised and many actually become obsolete in the new light of this type of warfare which doubtlessly will be employed on a grand scale by our enemies during a full-scale war. This is obvious because it has been employed very successfully during World War II and by now no doubt has been revised, refined, and tailored along the needs of a known adversary—the West—to the smallest detail. Whether it is known under the title of guerrilla or partisan warfare is immaterial at the moment; but the very fact that this is a different approach to modern warfare and is fought concurrently with the main action at the front by the same enemy or his representatives, must guide the commander in his decisions not only toward the known enemy, but toward the hidden enemy in his entire zone of operation.

To enlarge somewhat on this theme, we must throw some light on what the enemy expects and gets from the partisan movement. The Soviet system in war or peace envisions and practices everything in terms of "total." There is "total economy," "total participation," "total elections," "total government," and last but not least "total war." This means just what it implies, namely the total utilization of matériel and manpower in the pursuit of an economic, political, or military goal. The partisan movement, therefore, is an aid in achieving military victory over the opponent and it is a formidable one. It has been employed and will be used to the hilt in any future war.

Intelligence

The Soviet partisan movement has many missions and the main ones will be described here. However, one mission stands out over all others and that is the gaining of intelligence for the Soviet Army. If one realizes that from the frontline to the very limit of an occupied area, great numbers of partisans and enemy sympathizers, who are well organized and equipped, are constantly transmitting intelligence to the enemy, little can remain hidden to him. Offense, defense, attack, and withdrawal, will be known in detail to the enemy even during the planning stage. The opposition will take countermeasures at the same time an operation is planned and is not restricted to last minute shifting of forces and reserves after an attack has commenced. The element of surprise can be almost totally

discarded and the loss of this important factor alone may mean failure of an operation which under normal conditions should have been successful. Many a commander will soon feel "naked" and begin to wonder whether secrecy measures and the inherent discomforts connected with them are of any value at all.

If the enemy knows where we will hit or what areas we will defend or from where our forces will withdraw, the game becomes one-sided and costly. As a rule all partisans are intelligence agents—or potential ones—they are not marked, rarely wear uniform, and are not restricted to age or sex. Old men, young men, women, and children are the eyes and ears of the enemy—in short, the entire enemy population in the rear is the potential partisan. Obviously not all are active, but they form the reserve for the partisans and are recruited to keep their ranks full. The population indirectly will aid the partisans by supplying food and shelter and many of the necessities to keep the movement operating. It acts as the listening post for the partisans and reports rumors of troop movements, unit designation, and strength estimates. Partisan agents then investigate further and report competently and expeditiously to the Soviet intelligence agencies. During and before Soviet large-scale operations, partisan units are given complete essential elements of information and report promptly, giving the Soviet command valuable information on the enemy situation.

This net of partisan agents is not, as may be imagined, a loosely knit and haphazard organization, but is controlled and strictly supervised by the Soviet Army. It is constantly in touch with Soviet intelligence and has definite and well-defined tasks. A courier service is maintained by air and ground and special Soviet Army intelligence officers make frequent trips and inspection visits to partisan units. Partisan discipline is ironclad and death is mandatory for the least infraction of the rules. In addition to local recruitment, specialists from the unoccupied area are flown or infiltrated to partisan units whenever a special assignment requires it. It can easily be seen, therefore, that the commander is faced with a serious and far-reaching problem and his countermeasures are extremely difficult ones.

Scope

During the initial stages of armed conflict, the partisan mission will be restricted almost exclusively to the collection of intelligence; however, as operations progress their assignments increase in scope. The next stage is entered whenever the Soviet Army is forced to yield ground and thereby lengthens the enemy supply lines. In a vast theater, the maintenance and supervision of supply routes—both roads and railroads—is in itself a difficult task. The more extended the net, the more vulnerable it becomes. It is obvious that every army must supply enough guard personnel to protect its supply lines from ordinary hazards which are encountered during a campaign. These guards, however—under normal conditions—can be kept to a minimum with only the mission of keeping supply lines open and the traffic moving efficiently. Depots and supply points can be guarded by their operating personnel, since the only danger con-

The Soviet partisan movement is a formidable aid to the achievement of victory over an opponent in war. The partisan movement has been used successfully in the past and we may expect to see it in any future war

sists of attempts at theft. This—under normal conditions—keeps maximum manpower at the front to do the actual fighting. All this is, of course, known to the enemy and here again, he will use the partisans to advantage. Since these bands are well trained and usually well armed, they are at this stage committed against the weak points of the enemy's rear.

This, of course, does not mean that the partisans will suddenly appear in the rear area in the form of regiments or battalions and commence open military operations against our supply routes and depots—far from it. Their doctrine is to appear suddenly, overwhelm an unsuspecting enemy, and vanish as suddenly as they have come. Never will a partisan unit attack an equal or stronger enemy—for obvious reasons. Their mission is to kill and destroy quickly and then withdraw. Attack on a full scale and according to the tactical principles of battle are forbidden to them.

This mission of sneak attacks has a threefold purpose. It interrupts and destroys valuable supply lines and matériel; it instills in the enemy a feeling of fear—for he never knows when the bandits may strike, and, consequently, there is little security far behind the lines and life is in danger at all times. In the long run this produces a demoralizing effect. The third and most important purpose is that when these attacks mount in frequency and effectiveness, the opponent is forced to commit more and more personnel to protect these installations and thereby necessarily must weaken his strength at the front. Suffice it to say that the supply of the German Army in World War II, at one time, was completely stalled for 48 hours during the onslaught of a Soviet offensive, since the partisans had blown the railroads and disrupted their supply routes at over 9,000 points in one army group area within 24 hours. Supply convoys, in many partisan infested areas, can only proceed with strong military escorts and armored vehicles—and even then are subject to raids. Traffic at night becomes almost an impossible task and daylight hours are not sufficient to supply the front adequately.

Executioners

Another mission of the partisans is to act as executioners of collaborators in the enemy's rear. Since it is, of course, necessary—especially in those areas where civilian administration has again started to function—that indigenous personnel be employed as mayors, police chiefs, constables, work-gang supervisors, who then support our war effort, the partisans will commence a ruthless campaign of intimidation, kidnapping, and murder. Key personnel are the most vulnerable to these attempts and must be safeguarded. However, soon many of these will be found murdered or will disappear into oblivion. Replacements will be hard to find because those who would otherwise be willing to accept the position know that they will stand with one foot in the grave. Not all these administrative supervisors will be murdered or will vanish. Many will continue to serve our purpose, but only with the sanction of the partisans, because they submit valuable information to them. This campaign does not restrict itself to native personnel but also includes high ranking military officers. In short, there is only

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First Lieutenant Larry L. Wolff served with the 235th Engineer (C) Battalion, and later in a prisoner of war interrogation team in Europe and the Southwest Pacific during World War II. From 1946 to 1948, he was a member of the United States Prosecution Staff at the Nürnberg Trials. During 1949 and 1950, he was graduated from and assigned as an instructor to the Counter Intelligence Corps School. He served as a research analyst for the Office, Chief of Military History, Department of the Army. He is presently assigned as Adjutant of the 482d Field Artillery Battalion, Henry Barracks, Puerto Rico.

safety in numbers and, of course, the larger the number of personnel required for security, the less the Soviet Army has to fight at the front.

Party Workers

The last and by far not least important mission of the partisans is the re-establishment of the Communist Party in occupied areas, for "communism must never be allowed to recede from the mind of the populace." Cells are newly formed and propaganda literature distributed. Those who refuse are warned that upon the return of the Soviet Army their day of reckoning will come.

The problem has been presented. The final solution will have to come when we have to "cross the bridge." It must be recognized by all *now*. The sooner the stark implications are realized, the quicker we can cope with the situation when it arises. Everyone must know what may face him and this knowledge alone may blunt the enemy effort to some extent, for we fear only the unknown.

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The Principles of War and The Solution of Military Problems

Lieutenant Colonel Marshall L. Fallwell, *Infantry*
Instructor, Command and General Staff College

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.

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A BASIC aim of the Command and General Staff College is to develop, in potential commanders and staff officers, the ability to solve military problems. This the College attempts to do—and does quite successfully—by presenting the basic factors of, and their influence on, the problem and, through the use of appropriate forms, a sound, logical approach to the solution of problems is reached.

Yet commanders and staff officers—including some graduates of the College—do make wrong decisions. There are many reasons for this—mental, emotional, and physical. The factors and their influence may be incorrectly estimated. The problem itself may not be fully recognized. The logic may be faulty. The thought processes by which a problem is solved may be misunderstood. At the risk of oversimplification, it can be stated that the basic mental reasons for poor decisions are three in number: lack of understanding of the problem, lack of knowledge of the factors and their influence on the problem, and incomplete knowledge and use of thought processes in solving the problem.

Adequate knowledge of the factors involved in a military situation and their influence on the decision requires years of experience and study. Although our military colleges can help provide knowledge, they can never completely replace personal experience. On the other hand, our schools can and do provide instruction and practice in sound methods of recognizing problems and arriving at decisions.

Estimate of the Situation

The best example of such a method is the commander's estimate of the situation which receives great emphasis at the Command and General Staff College. The estimate—its present form is a product of many years' study and experience—provides for a natural, sound approach to the solution of a tactical problem. Following a statement of the mission, the significant conditions of weather, terrain, and the opposing forces are listed. Next are listed those courses of action which appear feasible and which, if successful, will accomplish the mission. Then the commander mentally "war-games" each of his courses of action against each enemy capability and determines the probable outcome, while further testing the feasibility of his courses of action and determining the factors which are most significant. After the "war-gaming" the commander compares his courses of action in the light of the significant factors. Finally, he selects the best course of action and embodies it in his decision.

Thus, in our estimate of the situation, we have followed what the United States Naval War College terms the "natural mental process for solution of *any problem.*" (See Figure 1.)

An orderly process? Yes. Sound? Yes. Simple? No.

The complexity of the estimate process arises from the numerous chances of error which present themselves. First of all, the estimate must contain a number of subordinate estimates. At the outset, the mission must be estimated. This, of course, is a relatively simple matter if one has been ordered to seize and hold a certain hill, but is it a simple matter when a commander must decide whether to attack or defend? If the commander does not state his mission correctly, then any decision he reaches is likely to be a bad one.

The statements of the conditions of weather, terrain, and opposing forces constitute not only facts but—in a large measure—estimates as well. Here, staff estimates are usually involved—personnel, intelligence, operations, and logistical estimates. Perhaps the intelligence estimate offers the greatest chance for error—but our own capabilities can also be misunderstood.

The selection of courses of action involves another estimate—or series of estimates. If only one or two courses are listed, there is the possibility that the *best* will not be considered. If too many courses of action are considered, then the estimate will be very long and involved.

Finally, there is the estimation involved in analyzing and comparing the various courses of action in order to select the best.

According to the Naval War College's *Sound Military Decision:*

Logical thought separates the rational from the irrational. Its use avoids the wastefulness of trial-and-error method. By its insistent employment, dormant powers of reasoning are awakened, and the danger that attends instinctive, spontaneous, impulsive, or emotional acceptance of conclusions is lessened. The evil effects of an inclination to dodge the issue or of a disinclination to face the facts are thus also avoided.

Man is a rational animal. Man's rationality, however, is unfortunately influenced strongly by tradition, habit, bias, and a lazy tendency to accept plausible suggestions. Too often what little reasoning man does is concerned with justification of a decision already reached.

A notable characteristic of the human mind is a constant search for reliable rules of action inspired by an intuitive belief in cause and effect. If not provided with sound rules, man will devise his own out of his own experience and follow them, although they may be faulty. This drive for valid guides has given us a mass of proverbs, adages, and aphorisms dating from antiquity.

The Principles of War

We must reckon, then, with this psychological drive for valid guides; and the best solution is to provide ourselves with valid rules. Since warfare is a science—that is, since the phenomena of war follow the natural law of cause and effect—we should be able to state the general relationships between causes and effects in war, although not with the quantitative precision customary in the physical sciences. In other sciences such statements

Our principles of war, and those of other nations, represent those proved concepts or points of doctrine which, in the opinion of the times, deserve more emphasis than other equally valid concepts or doctrines

are known as principles—they are also natural laws because they express facts of nature.

The search for valid rules of conduct by the armies of the world has led to the formulation of principles, rules, maxims, and doctrine in an effort to capitalize on past experience. A vast number of casual relationships and historical examples form the science of war. However, the mere compilation of knowledge is not enough. Too many commanders have failed because they blindly applied methods which—however successful in the past—were inadequate in a new situation. The resulting disillusionment led to two schools of thought. One group averred that brilliantly successful generals like Napoleon and Alexander were geniuses whose successes were due to intuition rather than methods, and that warfare could never be reduced to a science. Maurice de Saxe, Marshal General of the armies of France, once stated that:

War is a science so involved in darkness, and attended with so much imperfection, that no certain rules of conduct can be given concerning it; custom and prejudice, the natural consequence of ignorance, are its sole foundation.

Fuller in his *Foundations of the Science of War*, quoted Dragomirov as stating:

First of all, science and theory are two different things, for every art may and must be in possession of its own theory, but it would be preposterous to claim for it the name of a science. . . . Nobody will venture today to assert that there could be a science of war. It would be as absurd as a science of poetry, of painting, or of music.

In the opposing camp are men like Clausewitz and most modern military leaders who believe that there *are* principles which *can* be discovered.

Jomini believed:

The fundamental principles upon which rest all good combinations of war have always existed, and to them all others should be referred for the purpose of arriving at their respective merits. These principles are unchangeable; they are independent of the arms employed, of times, and of places.

Napoleon advised:

Peruse again and again the campaigns of Alexander, Hannibal, Caesar, Gustavus Adolphus, Turenne, Eugene, and Frederick. Model yourself upon them. This is the only means of becoming a great captain, and of acquiring the secret of the art of war. Your own genius will be enlightened by this study, and you will learn to reject all maxims foreign to the principles of these great commanders.

From the work of this latter group has developed the principles of war which are recognized by the various nations. From ancient China has come the 13 principles of Sun Tsu. From Napoleon's writings have been derived 115 maxims. The German Von Clausewitz gives us three, seven, or more principles, depending on how one interprets the word. The French General Foch listed four principles at the turn of the century, ending his list with a significant "et cetera." The British General Fuller deduced 6 principles in a work

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Lieutenant Colonel Marshall L. Fallwell served in Sicily, Italy, and the European Theater with the 3d Chemical Mortar Battalion during World War II. From 1946 to 1949, he was assigned to the Intelligence Division, Department of the Army, General Staff. He went to Korea in July 1951, where he was a member of the G2 Section, Headquarters, Eighth Army. He is a graduate of North Carolina State College and attended The Infantry School from 1949 to 1950. Upon his graduation from the Command and General Staff College in 1953, he became an instructor at the College.

of 1909; later he expanded this number, first to 8, then to 11, and finally settled on 9. From these writers and others, the national principles shown in Figure 2 were derived.

The differences in the number of principles accepted by the various nations are based, not so much on doctrinal and organizational differences, as they are on the desired degree of emphasis to be given certain concepts. No one will say that British plans and orders are likely to be complicated because they have ignored the principle of simplicity. Similarly, tactics of the French are not defective because they profess to find only 3 principles rather than the 9 United States or 10 British principles. All of the concepts embodied in the principles are taught in all armies, but with differences in interpretation and emphasis.

The United States official list of principles is a product of the twentieth century. Our Field Service Regulations of 1904 are reported to have contained the following statement—but not a list of principles:

While the fundamental principles of war are neither very numerous nor complex, their application may be difficult and must not be limited by set rules. Departure from prescribed methods is at times necessary. A thorough knowledge of the principles of war and their application enables the leader to decide when such departure should be made and to determine what methods should bring success.

SOLUTION OF A PROBLEM

The Natural Mental Process	*The Commander's Estimate*
Step 1. The establishment of the proper basis for solution of the problems, including (a) a grasp of the salient features of the situation, (b) a recognition of the incentive, and (c) an appreciation of the effect desired.	(a) Determination of the mission. (b) Statement of the factors of weather, terrain, and own and opposing forces. (c) Determination of those suitable courses of action which, if successful, will accomplish the mission.
Step 2. The actual solution of the problem through the employment of the reasoning power in the consideration of various possible solutions, and the selection of the best solution.	(d) Analysis of each course of action in light of each enemy capability. (e) Comparison of courses of action. (f) Conclusion as to best course of action.
Step 3. The conclusion or decision embodying the best solution.	Decision embodying the best course of action.

Figure 1.

Training Regulations 10-5 of 1921 contains what is apparently the first official list of principles, but the publication gave the names only without explanation and the list was rescinded in 1928. The Field Service Regulations of 1923 treated the principles without naming them. Its successor, Field Manual 100-5, *Field Service Regulations, Operations,* continued this approach until our present edition of 1949 which both names and discusses the principles.

Although our Army was apparently late

in its official acceptance of the principles, they were taught much earlier, as evidenced by General Pershing's statement:

But the principles of warfare as I learned them at West Point remain unchanged. They were verified by my experience in our Indian wars, and also during the campaign against the Spaniards in Cuba. I applied them in the Philippines and observed their application in Manchuria during the Russo-Japanese War.

CURRENT PRINCIPLES OF WAR

United States	*British*	*French*	*Soviet*
Objective	Selection and Maintenance of the Aim	———	Advance and Consolidation
Simplicity	———	———	———
Unity of Command	Co-operation	———	Combined Arms
Offensive	Offensive Action	———	Offensive
Maneuver	Flexibility	Liberty of Action	Maneuver and Initiative
Mass	Concentration of Force	Concentration of Effort	Concentration
Economy of Force	Economy of Effort	———	Economy of Force
Surprise	Surprise	Surprise	Surprise and Deception
Security	Security	———	Adequate Reserves
———	Maintenance of Morale	———	Morale
———	Administration	———	———
———	———	———	Annihilation

Figure 2.

In the British Army a very similar procedure took place. General Fuller has related how, in 1911, he read in the British Army Field Service Regulations that "the fundamental principles of war are neither very numerous nor in themselves very abstruse . . . "; but that he searched for them in vain. Spurred by the need for valid principles, he finally evolved nine principles; in 1923, he realized the satisfaction of seeing most of them printed in a service manual. The original British principles remained substantially unchanged until after World War II when two others, Administration and Maintenance of Morale, were added, due, one may guess, to the influence of Field Marshal Montgomery.

Within the United States Army, the principles of war have been regarded as basic truths, applicable to all situations, intelligent application of which will aid success. Although apparent conflicts between principles are recognized—mass and security for example—we teach that a principle should be violated or disregarded only after mature consideration

of all factors involved. The principles have never been stated as laws of cause and effect. They represent, in fact, certain durable, proved concepts which, in the opinion of the times, deserve emphasis over all other concepts. Interpretation of the concepts has varied, of course, and will doubtlessly vary in the future.

Criticism of the Principles

Captain Frank L. Johnson, United States Navy, wrote, "The mere mention of the term 'principles of war' brings out the semantic beast in certain individuals." stantives which could be interpreted in many ways. Some wanted to expand the list. Others—appealing to the dictionaries—wished to discard all which were not basic to every situation. As an example, Brigadier General Charles M. Bundel—former Commandant of the Command and General Staff School—could find only five basic principles—offensive, simplicity, objective, superiority, and security. The others he thought valid as doctrine but not as principles.

Later critics—notably the Naval War College and Colonel E. S. Johnston, for-

DEVELOPMENT OF THE UNITED STATES PRINCIPLES OF WAR

TR 10–5 (1921)	FSR* (1923)	FM 100–5, Tentative* (1939)	FM 100–5* (1944)	FM 100–5 (1949)
PRINCIPLES OF WAR	GENERAL PRINCIPLES OF COMBAT	GENERAL PRINCIPLES FOR CONDUCT OF WAR	DOCTRINES OF COMBAT	PRINCIPLES OF WAR
Objective	Objective	Objective	Objective	Objective
Offensive	Offensive	Offensive (Mobility)	Offensive	Offensive
Mass	Concentration of Superior Forces	Concentration of Superior Forces (Economy)	Concentration of Superior Forces	Mass
Economy of Force	Economy of Force	———	———	Economy of Force
Surprise	Surprise	Surprise	Surprise	Surprise
Simplicity	Simplicity	Simplicity	Simplicity	Simplicity
Security	Security	Security	Security	Security
Movement	———	———	———	Maneuver
Co-operation	———	Unity of Effort	Unity of Command	Unity of Command
———	Quality** Fire Superiority	———	Quality**	———

NOTES: * Where the principles are not formally titled, the key word or major concept of each numbered paragraph has been chosen. Lesser included concepts are placed in parentheses.

** By "Quality" is meant "greater mobility, higher morale, and better leadership." FSR, 1923, paragraph 381.

Figure 3.

As soon as the principles were published, an argument began which has continued until the present day. For every article in a service journal which expounded the official line, there appeared another article attacking one or more of the principles. Most early objections were based on the grounds that the principles were a mere list of nouns or noun sub- mer instructor and librarian at Fort Leavenworth—attacked the principles on firmer ground. While not denying their value as concepts, they claimed the principles were not stated properly—that is, that relationship between cause and effect was not shown; that doctrine and method was being confused with principle; and that the label "principle" had misled some

commanders to believe that these concepts were basic rules to be applied to every situation. Thus, it was said, faulty rules of actions have been derived from concepts designed to replace such faulty rules.

Colonel Johnston cites the following from World War I on the confusion of principle and method:

General Harbord says that to induce acceptance of the American original idea of unity of control of supply, our General Headquarters had likened it to unity of command. Foch then seized upon this opening to press for the project—not so bad for the French, but certainly undesirable for us—of complete unity of interallied supply. 'It was a bit awkward,' Harbord tells us, 'for General Pershing to urge the principles and the limitations at the same time.'—It was awkward, no doubt of that. It was awkward because our General Headquarters had mistaken a method for a principle.

In a search for true principles, these later writers were led to expand on the old adage, "It depends on the situation," and to produce such statements of causal relationships as appear in the Naval War College's *Fundamental Principle of War*:

The attainment of a military objective (the creation or maintenance of a favorable military situation) depends on effective operations involving the salient features of

[1.] Effective action with relation to correct physical objectives,

[2.] Projection of action from advantageous relative positions,

[3.] Proper apportionment of fighting strength, and

[4.] Ensurance of adequate freedom of action,

each fulfilling the requirement of

[a.] Suitability, as determined by the factor of the appropriate effect desired,

[b.] Feasibility, by reason of relative fighting strength as determined by the factors of the means available and opposed, influenced by the factor of the characteristics of the theater of operation, and

[c.] Acceptability, as determined by the factor of the consequences as to costs, which factors are in turn dependent on each other.

Statements of this type have a definite value in that they constantly refer one to the controlling conditions of the current situation. Whether or not they will ever satisfy man's inherent thirst for set rules of action is questionable. One feels that man may make an equivalent error by applying yesterday's conditions in lieu of tomorrow's. Still, causal principles are in accord with "the Natural Mental Process" described earlier. Their further use should be studied by our service schools.

Their first application could be to the solution of two problems incident to the commander's estimate of the situation—the determination of a suitable mission, and the formulation of courses of action to be considered at length. In this connection, the following propositions apply:

1. The determination of a suitable objective depends upon:

a. The suitability of the objective in light of the future mission of the command.

b. The feasibility of the objective as determined by the means available and opposed, the time available, and the condition of the theater.

c. The acceptability of the costs involved.

2. The selection of a suitable course of action for accomplishment of an objective depends upon:

a. The suitability of the course of action with regard to the objective and the future mission of the command.

b. The feasibility of the course of action, as determined by the means available and opposed, the time available, and the conditions of the theater.

c. The acceptability of the costs involved.

There is nothing new here, of course. Our first proposition merely states that an objective must further the mission of the command, must be capable of achievement in the time available, and must be acceptable as to costs. This last statement is correct and the language is familiar to all; so, why change it? One must admit there is no great necessity. The advantage of the proposition, however, is that it points out the relationships of the factors involved and thereby contributes to a frame of mind—a method of thinking—which is a distinct asset to the service officer.

In the remaining pages, the author proposes to examine our principles of war and determine their application to the solution of military problems.

Objective

The ultimate objective of all military operations is the destruction of the enemy's armed forces and his will to fight. Selection of intermediate objectives whose attainment contributes most decisively and quickly to the accomplishment of the ultimate objective . . . must be based on . . . complete knowledge of the enemy and theater of operations. . . .—Field Manual 100-5, *Field Service Regulations, Operations.*

The term "objective" has two distinct meanings. In the larger sense, it is the "effect desired," or the creation of a favorable military situation. This we usually term the mission. In the first sense, the objective is common to all military operations. Applied to offensive operations, it may be the seizure of certain terrain or the destruction of an enemy force; in defensive operations, the objective may be to deny an area or facility to the enemy, or it may be simply to maintain the integrity of a certain force. The proper sequence of planning is to first determine the ultimate mission. Based upon this, one determines favorable military situations which favor accomplishment of the ultimate mission. These situations then become intermediate missions.

In the second sense, in tactics, the creation of a favorable military situation can often best be expressed in terms of physical objectives for an attacking force. This is the second, and more usual, meaning of the term.

The one principle of war which is controlling is the objective.

In solving military problems, the first step is to establish the objective or mission. An improper objective must inevitably lead to wasted resources—if not to failure. In arriving at his objective, the commander must bring into play all of his knowledge and reasoning power. This heavy responsibility grows with the degree of discretion permitted, but it is not inconsiderable even when a physical objective has been assigned by the higher commander. Nearly always, there will be missions to be deduced or implied, and intermediate objectives to be chosen.

To aid us in selecting physical objectives, certain criteria are laid down in our field manuals. We say that a proper objective must be attainable in the time and space limits imposed and should facilitate future operations; the threat of its capture should compel the enemy to evacuate his position or risk destruction therein; it should produce a convergence of effort; and it must be easily identified.

We have no analogous criteria in our field manuals regarding the selection of an objective in the sense of the mission, but certain guides can be determined. Earlier, we stated that a suitable objective or mission of the command will be capable of achievement in the time available, and will be acceptable as to costs. Other desirable characteristics could be deduced, but these are the basic ones which must be present in all cases.

We are striving to produce leaders who use their reasoning powers rather than rely on set rules of action. The danger in this principle—and the others as well—is that the unwary may convert it into an invariable rule of action or slogan, such as "seek out and destroy the enemy's main force." Views such as this were at least partially responsible for the bloody and indecisive fighting during most of World War I. Dr. Bernard Brodie cites the more recent example of the United States Third Fleet at Leyte Gulf. Following the United States landings on Leyte, the Japanese initiated a naval counter-attack involving two task forces, comprised mainly of battleships and cruisers, which were to encircle the island from the east and converge on the landing areas. A small decoy force of carriers approached from the north and west. The United States naval commander decided to steam north and attack the carriers because of the then current concept that "the enemy's main force is where his carriers are."

Dr. Brodie then said:

But the question asked was, 'Where are the enemy's carriers? That is where his main force must be.' I submit that this was true for the preceding 2 years of the war, but at the time of Leyte Gulf it was no longer true, and I submit also that the intelligence was available to the fleet which should have indicated that it was no longer true. . . . In that battle the enemy's main force comprised in fact his battleships. That would have been clear except for the existence of the slogan.

The Offensive

Through offensive action, a commander preserves his freedom of action and imposes his will on the enemy. The selection by the commander of the right time and place for offensive action is a decisive factor in the success of the operation. A defensive attitude may be forced on a commander by many situations; but . . . should be deliberately adopted only as a temporary expedient. . . .—Field Manual 100-5, *Field Service Regulations, Operations.*

Our doctrine of the offensive is as basic as any concept in the United States Army; for only through offensive action can we ultimately destroy the enemy's armed forces. Only through the offensive can we retain the initiative. Therefore, we are taught that even when forced to assume the defensive we should conduct an aggressive or offensive defense.

The basic nature of this principle, however, has misled many commanders who elevated it to the "rule of war" by insisting on the attack at all times. Marshal Foch, whose early writings on this principle had much influence in World War I, had the following to say in his postwar *Memoirs:*

. . . the doctrine of the offensive . . . tended to impose an invariable rule *leading too often to tactics that were blind and brutal and for that very reason dangerous. It also produced a strategy that was bare and uniform, easily sterile, unproductive of results, and costly.*

This degeneration of a sound concept into a faulty rule of action is a very human failing. Man seeks invariable rules of action and is immensely comforted when he thinks he has discovered one. No bitterer condemnation of a commander of this type has been written than the following words by General Fuller in speaking of a high British commander during World War I:

His [Haig's] theory of fighting was as simple as General U. S. Grant's, and he never once budged from it, whilst Grant did. From history he [Haig] had learned that battles passed through the following phases: the maneuver for position, the first clash of battle, the wearing-

out fight of varying duration, and the eventual decisive blow, which would give victory.

It had been so and, consequently, it must be so in all circumstances and irrespective of changes in armaments. As the decisive blow in former wars had been delivered by cavalry, cavalry remained the decisive arm; consequently, they figured in all his battles, irrespective of mud, fire, and wire. As this blow had to be preceded by the wearing-out fight, which hitherto had been carried out by infantry and artillery, this must continue; for of the new arms Haig could grasp nothing, because of them history could tell him nothing. His creed was that 'firm hold be kept of first principles, and that a plan, when once it had been accepted, must be adhered to and pursued with determination.' This meant that, 'whatever the strategy, final victory could come only when, after the first clash of battle, the wearing-out fight, of whatsoever character it might be, had exhausted and reduced the enemy's power of resistance and his will to fight.' So it happened that on 28 June 1917, he is reported to have said, 'that if the fighting was kept up at its present intensity for 6 months, Germany would be at the end of her available manpower.'

The solution to the problem, of course, is not to discard our valid principles and concepts but to state them so that the relationship of cause and effect is evident, and to educate our leaders to rely on their powers of reason rather than "invariable" rules of action.

The ultimate value of the offensive is that it is the only reliable way to break the enemy's will to fight—with the possible exception of strictly limited conflicts. The everyday results of successful offensive action are initiative and high morale. General Patton thought so highly of these that he once forbade dissemination below general officer grade of an order to assume the defensive.

In solving military problems, the action taken must be consistent with the ultimate destruction through offensive action of the enemy's will to fight. If the correct present decision is to assume the defensive, the plan adopted must provide for suitable offensive action such as raids, and limited objective attacks and counterattacks.

Mass

Mass or the concentration of superior forces, on the ground, at sea, and in the air, at the decisive place and time, and their employment in a decisive direction, creates the conditions essential to victory. —Field Manual 100-5, *Field Service Regulations, Operations.*

The concept of mass is certainly basic. Mass or concentration of forces is recognized as a principle of war by most world powers—with the notable exception of France.

The idea of mass has given birth to many familiar slogans and quotations—all of which are not wise: "God is on the side of the biggest battalions." "Git thar fustest with the mostest." "Fire kills."

Mass, like the other principles of war, must be applied with caution. Above all, the equation of mass and mere numbers must be avoided lest we become involved in another killing match between huge armies such as occurred in World War I. Compare the Communist reliance on massed manpower and their callous acceptance of huge losses. Although numerical superiority is often desirable, there are other factors which may be equally, or more, important in obtaining mass—armor, artillery, air, the state of training, and morale, to mention but a few. In solving military problems, we must consider the principle of mass at all times. In the formulation of courses of action, mass for the main effort is usually stated in general terms only. In the analysis of opposing courses of action, the degree and nature of mass, both

that necessary and that available, can be visualized. Finally, details are developed in the complete plan to ensure the desired mass at all foreseeable stages of the operation.

Mass is not achieved for its own sake. For a modern example, let us return to Dr. Brodie's comments on the Battle of Leyte Gulf. The American naval commander tells us that after discovering the three Japanese task forces moving toward Leyte, he formulated three courses of action: to remain where he was; to attack the carriers to the north with all his force; or to divide his force, keeping part in the area and sending part to attack the carriers. He decided against splitting his force because this would conflict with the "principle of concentration of force." Dr. Brodie has the following to say concerning this reasoning:

The purpose of the principle of concentration of force is to suggest that one should so allocate one's forces that one can hope to be superior to the enemy somewhere, preferably in the most important place, or at least minimize one's inferiority in the decisive place. I submit that the commander of the Third Fleet had forces so overwhelmingly superior to those of the enemy that he could have divided his forces between San Bernardino Strait and the north and have remained overwhelmingly superior locally to each enemy force. And when you are overwhelmingly superior—how much more superior do you want to get?

Economy of Force

The principle of economy of force is a corollary to the principle of mass. In order to concentrate superior combat strength in one place, economy of force must be exercised in other places.—Field Manual 100-5, *Field Service Regulations, Operations.*

Here the dependence of this principle of war is recognized. Properly speaking, it is a method of achieving mass.

The term economy of force has wide acceptance among armies of the world but is not always interpreted the same way. One influential writer has raised this principle to the status of "the law of war." To the British and Canadian Armies, economy of force implies, "a balanced employment of forces and a judicious expenditure of all resources with the objective of achieving an effective concentration at the decisive time and place." Here economy is interpreted in the nineteenth century sense of "utilizing all resources" rather than in the twentieth century sense of "to economize; to save."

The inexactness inherent in the use of single nouns or noun substantives to signify concepts or principles is well illustrated.

In the broad sense, economy of force pertains to the proper apportionment of forces and resources between main and secondary efforts and reserves. Weighting the main effort is naturally stressed in our Army schools. At this point, it might be well to show that secondary efforts must also be weighted at least to the extent necessary to enable them to accomplish their missions. Secondary efforts are not only desirable—they are required. "Every attack must have a main and secondary effort."

In solving military problems then, we must clearly state the minimum objectives to be attained by the secondary effort and to allot the minimum forces required.

Any remaining resources are used to strengthen, in priority, the main and secondary efforts. The question is, where can we afford to economize, and to what degree?

Unity of Command

Unity of command obtains that unity of effort which is essential to the decisive application of the full combat power

of the available forces.—Field Manual 100-5, *Field Service Regulations, Operations.*

Here, of course, unity of effort—or co-operation in the British Army and United States Air Force—is the desired end or principle, and unity of command is but a means to that end. Certainly, unity of command is not fundamental to all situations. To bear out this statement we need cite only two examples: the normal relationship between a regimental commander and his supporting artillery, and the relationship between a field army commander and the supporting tactical air force. One may be tempted to reply that unity of command in these situations is exercised by the division commander and the theater commander, respectively. If so, one also must admit that the principle is invalid in some cases and at some echelons.

On the other hand, unity of effort, or co-operation, is highly desirable and should be fundamental in every situation. History affords us many instances of opportunities lost because unity of effort was not achieved. Two examples which readily come to mind are Stuart's cavalry at Gettysburg and the lack—until 1918—of an effective high command among the Allies in World War I. World War II will doubtlessly furnish other examples. One potentially bad situation was that described by General H. H. Arnold regarding conflicting zones and interests between theaters of operations in the Pacific and the Far East.

Unity of effort depends on a number of factors.

First of all, various units and services must be working toward a common goal if complete co-operation is to be achieved. There must be no discordant jealousy or rivalry. Common training and equipment—especially signal communications means—are also vital to full co-operation.

Co-operation between allies—which has become more and more important—introduces still other factors such as national aims, divergent customs, and language difficulties. In dealing with allies one cannot do better than remember that "allies are at times difficult to deal with; when this occurs it is well to remind oneself that one is also an ally."

The degree of unity of effort achieved by a plan of action is a test of the validity of the plan. Therefore, unity of effort can be used as an aid in solving military problems. The statement of the mission, the selection of physical objectives, and the selection of possible courses of action all affect the co-operation to be achieved. In general, it can be stated that the maximum co-operation should be developed in the execution of a plan, but that the degree of inherent unity of effort is not the dominant factor in deciding on one of several courses of action. On the other hand, the ability of the command to achieve the unity of effort required in a particular course of action is a dominant factor in the retention or rejection of that course of action. In this last statement, we can see a close relationship to the application of surprise and simplicity. In this sense, the test for required unity of effort is a feasibility test.

For example, we may consider an attack across open terrain. As to time of attack, two general courses of action are possible: day and night. A night attack is a complex operation requiring careful coordination and teamwork among all elements. In other words, success in a night attack depends to a considerable degree on the ability of the force to achieve the required unity of effort. The ability of the command to accomplish the required co-operation would determine whether the night attack would be seriously considered.

In solving military problems then, we can ask the following questions:

1. Does the formulation of the mission

allow for full development of co-operation?

2. Is the command capable of achieving the degree of co-operation required by the proposed courses of action?

If the answer to either question is negative, then there has been an error.

Maneuver

Maneuver in itself can produce no decisive results, but if properly employed it makes decisive results possible through the application of the principles of the offensive, mass, economy of force, and surprise.—Field Manual 100-5, *Field Service Regulations, Operations.*

This quotation shows that maneuver—like unity of command and economy of force—is properly a method of achieving combat superiority. It is, however, an important concept which deserves emphasis. Maneuver is, of course, not to be sought for its own sake. Like all the other principles, except the objective and possibly security, maneuver may not be applicable to every occasion.

Maneuver is movement to place troops and fire at a more advantageous position with respect to the enemy. The comparable British principle, flexibility, is somewhat more inclusive than the United States term, maneuver. What is meant is not only maneuver of tactical units, but such considerations as mobility of mind inculcated during training, and mobility of supply.

Although it is hard to imagine that anyone would turn this principle into an end to be sought, the United States Naval War College has seen fit to warn: "Avoidance of movement (maneuver) is frequently the correct decision, because movement, if it offers no advantages, is scarcely justifiable even if it entails no material loss."

This principle has considerable application in the statement of possible courses of action and in development of the plan of action. The following questions are useful in selecting missions, objectives, and courses of action:

1. Is the command capable of achieving the *required* degree of maneuver? If not, the objective or course of action is infeasible.

2. Is the command's capacity of maneuver used to best advantage?

3. What is the degree of maneuver for the command relative to that for the enemy initially and throughout the action?

Surprise

Surprise must be sought throughout the action by every means and by every echelon of command. Surprise may be produced by measures which deny information to the enemy or deceive him . . . ; by variation in the means and methods employed in combat; by rapidity and power of execution; and by the utilization of terrain which appears to impose great difficulties.—Field Manual 100-5, *Field Service Regulations, Operations.*

Surprise, like many of our principles, is not sought in itself. In reality it is but a means or method for achieving combat superiority.

The first sentence of the quotation is representative of the more dogmatic statements which still appear in our field manuals. If by the phrase "must be sought" we mean "must be attempted" or "must be gained," then the statement is not taken literally and need not be. While surprise is usually desirable—and may even be essential—many measures—and especially active deceptive measures—require an expenditure of effort, the effect of which, on the main effort, must be weighed carefully. Again, a degree of surprise may be deliberately forfeited—as when we announce to the enemy that certain targets will be attacked, or when we disclose our own order of battle through the press.

In the estimate of the situation, we must ask ourselves four general questions. Are the courses of action stated in a

manner to allow development of surprise? What degree of surprise is necessary to success in each course of action? What degree of surprise is likely in each course of action? What will be the effect of this surprise, or the lack of it? Detailed measures for surprise, of course, will be developed after the decision is made.

Simplicity

Plans should be as simple and direct as the attainment of the objective will permit. Simplicity of plans must be emphasized, for in operations even the most simple plan is usually difficult to execute.—Field Manual 100-5, *Field Service Regulations, Operations.*

Simplicity in a plan or order has been interpreted in two very different ways: simplicity of *statement* of the plan or order and simplicity of the *operation* involved.

As an example of the first interpretation in which simplicity is synonymous with clarity, we may refer to General Eisenhower's directive:

"You will enter the Continent of Europe, and, in conjunction with the other United Nations, undertake operations aimed at the heart of Germany and the destruction of her Armed Forces."

This directive has been cited as a model of simplicity. Certainly it is a classic of its kind: brief, concise, and clear; but, one is entitled to wonder how *simple* it really is. Few will doubt that the concept involved, the conquest of Western Europe, entailed some of the most complicated operations of all times.

The second interpretation, simplicity of operation, is the more usual, but is vastly more difficult to attain.

Our 1923 Field Service Regulations state: "The task assigned to any unit must not involve a complicated maneuver. Simple and direct plans and methods are alone practicable in war."

In his *High Command in War*, Field Marshal Montgomery stated:

The first requirement of a simple plan is that each component part of a force should have its own task to carry out, and its operations should not be dependent on the success of other formations or units.

The years of experience reflected in our manuals tell us that simple plans and simple maneuvers are usually best. This must be good advice, and is not to be discarded lightly. But the application of the principle of simplicity is not easy.

This is so primarily because we do not seek simplicity in itself. Instead, we seek what we believe to be an effective means to a desired end. If the means we devise are complicated, we may sometimes discard them; but more often, we attack the complexity itself and attempt to reduce it by training and through better organization and equipment. Thus, our concept of simplicity includes the notion of acceptable complexity. With this in mind, we may expand our principle by adding:

"Complexities should be introduced into military operations only after careful consideration of the additional results to be obtained, the ability of the force to overcome the complexity in the time available, the cost, and the risk involved."

By complexity, we mean such matters as maneuver, movement, organization, coordination, and timing which are relatively difficult and which may require special training, equipment, and control. Certain operations such as the raid, the night attack, and chemical warfare can be very complex and difficult. Newer concepts such as amphibious, airborne, and atomic warfare are usually still more complex.

In the estimate of the situation, we can apply this principle by eliminating those courses of action whose complexities cannot be overcome, and by removing obviously unnecessary complexities in other courses of action.

In our expanded principle of simplicity,

we have a practical statement which refers us constantly to the determinants of the situation. It is compatible with our quotation from Field Manual 100-5, but is definitely contrary to the old Field Service Regulations which stated that plans *must not* involve a complicated maneuver. Strict adherence to the latter would induce sterility of thought and would have ruled out many developments such as airborne and amphibious warfare.

The evident change in interpretation of simplicity in the last 15 years throws considerable light on the nature of our principles.

Security

Adequate security against surprise requires a correct estimate of enemy capabilities, resultant security measures, effective reconnaissance, and readiness for action.—Field Manual 100-5, *Field Service Regulations, Operations.*

Security is recognized as a principle of war by all major armies except the French.

The quotation above points out only one aspect of security. Not only must the commander protect against surprise, he must also guard against known enemy capabilities. In the offense, security measures are taken to retain the initiative despite enemy counterstrokes. Active security measures include secondary attacks and the employment of reconnaissance forces and reserves. Passive security measures are designed to limit enemy knowledge of our activities and to minimize damage from enemy attack.

The commander must not take counsel of his fears, however, lest he develop a defensive attitude. "Bold action is essential to success in war."

In the estimate of the situation, the problem of security arises where our own courses of action are analyzed with respect to enemy capabilities. Then the general nature and timing of each threat is visualized. Detailed planning comes later.

One of the more interesting problems concerns risk, the obverse of security. The solution, of course, depends on how much one can afford to lose. Earlier, we stated that the suitability of any objective or course of action depends, among other things, upon the degree of risk involved.

Summary

In this article it has been suggested that the principles of war were developed through man's instinctive search for valid rules or guides. The nine principles of the United States Army and those of other nations represent those proved concepts or points of doctrine which, in the opinion of the times, deserve more emphasis than all other equally valid concepts or doctrines. A study of the principles has made it obvious that their statement and even their number has undergone steady change and refinement.

The same desire to minimize error in military decisions which produced our principles of war, has also produced our estimate of the situation which is a standard sequence for reaching tactical decisions. The estimate directs one's attention to the influences of the factors of the situation or the relationship between cause and effect. In other sciences, these relationships or laws are termed principles, but not so in the military where "principle" means "doctrine." Although the war of words has not yet terminated, the following points have emerged in the opinion of the author:

1. Our principles of war are valid concepts and doctrines.

2. Like all doctrine, principles of war are subject to change.

3. There is a requirement for fundamentals stated in the scientific form of cause and effect.

MILITARY NOTES AROUND THE WORLD

UNITED STATES

Inactivate Kilmer

In a move that will reduce the annual operating costs of the Army by approximately 1.4 million dollars, Camp Kilmer will be placed in a standby status for use in any future emergency, effective 30 June. The move will reduce the Army's overhead requirements by about 1,150 military and nearly 400 civilian personnel. The Army Personnel Center, now located at Camp Kilmer, will be moved to Fort Dix where a reduction in the strength of the Army and a corresponding decrease in training requirements will make available sufficient space to accommodate it.—News release.

Ocean Car Ferry

An ocean car ferry type transportation service between the United States and Alaska would be practicable, according to a survey conducted for the Army Transportation Corps. It was recommended that an 18-knot vessel capable of carrying 128 loaded rail cars or highway trailers would be best for the service. It was said that the car ferry type of operation could greatly improve peacetime Army shipping, but its prime importance lies in its effect on overseas military supply in time of emergency.—News release.

Civilian Exercise

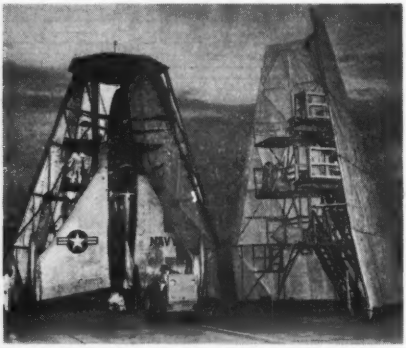
Approximately 150 civilian personnel of the Navy participated in a full-scale passive defense training exercise during the recent series of atomic tests in Nevada. The personnel, selected from the many Bureau of Ships field activities, are those who have major responsibilities in the Passive Defense Organization of their installations. The experience and information gained will enable each activity to plan its passive defense requirements more realistically.—News release.

Hold Production

Because of aerodynamic difficulties encountered, initial production of the *B-66* light bomber plane has been delayed. The manufacturer has engineered corrections to overcome these difficulties which will be proved by flight tests prior to resuming normal production. The Air Force estimates that the flight tests of this swept-wing jet tactical aircraft will be completed this summer. The Air Force stated that this action was taken to ensure that the *B-66* was a satisfactory combat article prior to delivery in quantity to tactical units and to prevent an extensive and costly modification program.—News release.

Unique Hangar

A unique, 36-foot-high tepee-shaped hangar, described as the smallest ever designed for a Navy plane, has been built to house the *XFY-1 Pogo*, the first vertical takeoff fighter. The hangar was built in two sections to provide protection from the weather and still give ground crewmen protected platforms from which to work on any part of the plane. Its flat-topped sections are mounted on wheels and open like a clamshell to receive the *Pogo* in its normal parked position—on its tail. The hangar is lightweight and sturdy, and can be dismantled and shipped easily.—News release.



Navy's smallest hangar houses the *Pogo*.

Intercontinental Missiles

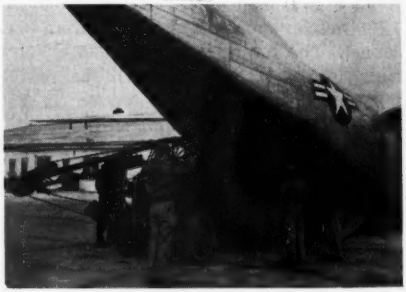
Under negotiation are diplomatic and technical arrangements for a 5,000-mile missile test range extending from Florida, across the South Atlantic, to Ascension Island. The United States expects to be able to fire missiles the length of the course, although they will carry test instruments instead of a warhead. It is reported that the United States is working on two types of intercontinental missiles: a supersonic, ballistic missile traveling at 12,500 feet a second; and a slower flying, turbojet-powered missile of greater accuracy which is steered by stellar navigation.—News release.

Refresher Courses

Designed to bring National Guard and Reserve officers up to date in tactics, techniques, and matériel of their appropriate branch and grade, the Army is starting a number of 2-week branch refresher courses.—News release.

Assault Transport

The addition of two *J44* turbojet units to the *C-123B* assault transport has provided an additional 2,000 pounds of thrust. The additional power was designed to increase safety characteristics of twin-engine aircraft and improve their performance under both takeoff and emergency flight conditions if a main engine fails. In the tests, with one engine feathered during takeoff, the rate of climb was increased from 150 feet per minute to 500 feet per minute. In demonstrations staged to serve as a guide in preparing the official loading manuals on this aircraft, a 15,780-pound truck-mounted crane shovel was driven aboard, with room to spare.



Assault transport loads heavy equipment.

There is a 38-foot cargo compartment with heavy duty floor tie-down fittings to secure cargo during flight. The lower half of a hydraulically operated 2-piece door assembly drops for the loading of vehicles and troops, while the top section is raised to the ceiling to provide vertical clearance. The plane is designed to carry 60 combat troops in its four rows of seats.—News release.

Sno-Freighter

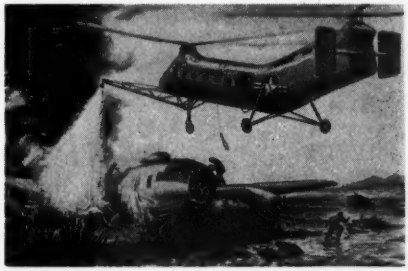
Specially designed for work in Alaska's frozen wastes to provide an overland freight link between areas normally isolated for part of the year by winter snow and cold, the world's largest vehicle on rubber tires will soon begin its operations. The 274-foot vehicle is coupled together in six sections so that it can turn corners. The *Sno-Freighter*, as it is called, consists of a power-control

***Sno-Freighter* is designed to provide overland freight link between isolated areas.**

car and five cargo cars, each with a load capacity of 25 tons. Individual cars can be uncoupled for loading and unloading. There are 24 electric wheels, powered by diesel-electric generating sets, which actually drive the vehicle. Each wheel has an electric motor and gear reduction inside its rim. Low pressure tires, 88 inches in diameter and 38 inches wide, are mounted on the rims for traction and flotation over snow and frozen surfaces. Only one person is required to operate it. All cars are waterproofed to a height of 6 feet and their decks are 8½ feet off the ground.—News release.

Fire-Fighting Helicopter

Plans to convert an *H-21* helicopter into a flying fire truck with the latest in fire-fighting equipment to fight aircraft and other fires which are inaccessible by present type ground fire trucks have been proposed. As most air bases are constructed on real estate of low value, the terrain along runway approach zones is often wooded, rough, marshy, or swampy making it most difficult, if not impossible, to reach a wreck in this area by wheeled type fire-fighting equipment. The helicopter fire truck, with its ability to rise vertically and fly at speeds of over 130 miles an hour, regardless of ground



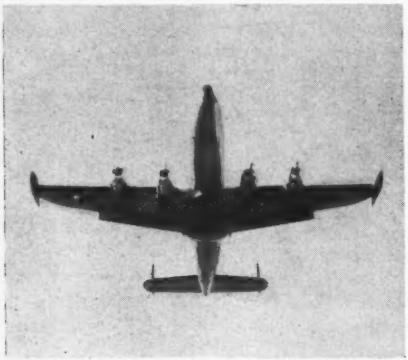
Proposed helicopter will aid firefighters.

conditions, to the accident scene and immediately employ modern fire-fighting techniques, will save lives and equipment which otherwise would be lost. The *H-21* has sufficient carrying capacity to lift an effective quantity of fire-fighting agent and the equipment for its application.

It is recommended that the fire-fighting equipment be in the form of a kit which could be installed in the highly mobile plane. The helicopter's mobility permits it to position the application of the agent most advantageously and to change positions quickly as the fire is brought under control. The helicopter's ability to fight fires inaccessible from ground level will permit effective fighting of fires in radar towers, upper stories of multistory buildings, aboard ships at sea, and other similar types.—News release.

Atlantic Watch

Able to fly hundreds of miles out over the Atlantic Ocean, the *RC-121* radar planes will spread an early warning radar screen high above this ocean to provide safety for the Nation's east coast. The 75-ton planes are similar in appearance to the *Super Constellation* except that they have huge radar domes protruding from the top and bottom of the fuselage. They can carry 6 tons of radar and electronics gear with a crew of 30. The planes soon will inaugurate around the clock sentinel duty off the east coast. The planes



Radar planes add to east coast protection.

will be in constant communication with shore bases to summon interceptors to the attack if suspected craft cannot prove their identity. The black radome beneath the fuselage carries a revolving antenna which transmits protective radar beams over greater areas, farther out from the coastline than was possible with surface radar. A fin-like radome, with another huge antenna, sits atop the plane's fuselage, and other electronic beams pour from the plane's black-tipped nose. On the wingtips are extra fuel tanks to give the far-flying planes added range and endurance. The cabin is soundproofed and completely pressurized. Seats in the plane have been scientifically designed against fatigue.—News release.

Atomic Tank

Already in the experimental stage at the Detroit Arsenal is an atomic-powered tank. It was reported that the Army is able to build a 70-ton tank with an atomic engine but its weight makes it impractical for combat use. Development work is under way on a lighter model.—News release.

Lightweight Phone System

The development for the Signal Corps of a new lightweight telephone system with treble the capacity of former models has been announced. The new system uses a carrier principle to allow 12 simultaneous conversations to share the same cable by using a different frequency for each. It can be used for distances up to 200 miles.—News release.

Picture Window Tent

The problem of getting daylight into squad tents while keeping out the wind and bugs has been solved by the Quartermaster Corps and all squad tents built in the future will have a huge, vinyl-film window which will roll and unroll as easily as canvas. They will be equipped with easy to operate fasteners so they can be blacked out at night when the occasion calls for it. In addition, the new tents will have screen sidewalls which will provide an effective barrier to mosquitoes and other insects. The new, fire-resistant tent is the same size as the one it replaces and will comfortably sleep 16 men in summer. The new tent was designed not only to provide more comfort for soldiers in the field but also to reduce the number of different types of tents now in use by the Army. It will be used not only for quarters but also for mess halls, command posts, offices, and other similar purposes. As old tents are worn out, the new ones will replace them. The new tent, costing $404.35, is cheaper than the previous model which costs $447.06.—News release.

Study Desert

Because of an 18-month research project by geographers at the University of California at Los Angeles, United States troops will be equipped better for desert warfare of the future. To gather around the clock, around the calendar weather data on the area of the Providence Mountains of the Mojave Desert for the Quartermaster Corps, 14 small weather stations were erected at various elevations. The Army wanted to learn everything about the climate, vegetation, and topography of a typical mountain range. Among the surprises received by the researchers was the discovery that desert mountain summits are warmer on winter nights than the desert floor. They also discovered that summertime humidity is considerably higher than winter humidity, and dark colored basaltic rock is 30 degrees warmer in summer than is light hued granite.—News release.

Increase Firepower

Without revealing details, a Pentagon official reported that even without atomic cannon and guided missiles, the United States infantry divisions now have approximately 80 percent more firepower than during World War II. It was reported also that the Army's capabilities would be increased further by atomic cannon and missiles now becoming part of the Army organization in Europe.—News release.

Guided Missile Craft

Following its rearmament with *Terrier* guided missiles, the heavy cruiser *Boston* is expected to rejoin the fleet in midsummer as an antiaircraft ship. According to the Navy, the *Canberra*, a sister cruiser of the *Baltimore* class, will assume a similar role by the end of the year. The *Terrier* is a short-range missile reported to be effective up to 5 miles. A *Terrier II* with increased range is said to be under development.—News release.

Mine Warfare

A naval task force comprised of surface ships, aircraft, and submarines recently engaged in a variety of mine warfare maneuvers called *Lantminex* designed to improve the readiness of the fleet in this type of warfare. The employment of mines for both offensive and defensive naval operations was tested. Various types were used and they were planted by both aircraft and surface units. Instead of normal explosives, the mines fired pyrotechnic signals when actuated. All types of fleet minesweepers participated including some new wooden hull type ships and minesweeping boats which recently joined the fleet.—News release.

'Drone' Helicopter

After flying tests lasting over 1 year, a remote controlled helicopter designed as a research and development vehicle is being evaluated by the Navy Office of Naval Research. Basically an *HTK-1*, the plane has been modified so that it can be flown by an operator of a ground control station. More than 100 hours of remote control operation, including takeoffs and landings, backward, sideward, forward, and hovering flight, have been accomplished during the period in which the craft has been flying. The operator transmits command signals by radio from the ground station to the controls in the "drone." Although the system is somewhat similar to the remote control of fixed-wing aircraft, the problems that had to be overcome in the remote control helicopter were far more complex because of the helicopter's ability to rise and descend vertically, stand still in midair, and fly forward, backward, and sideward slowly or fast. It was necessary also to develop a suitable small automatic pilot and miniature gearboxes to be used with the system. All flights have been limited to the visual range of the operator at the ground station.—News release.

GREAT BRITAIN

Rescue Method

A new means of rescuing survivors from the sea by lowering a net to them from a helicopter and scooping them up like so many fish has been developed by the Royal Navy. The device will be used to rescue injured and unconscious men who might be further injured by the usual method of fastening a strap or sling around their waists. It is being supplied to British aircraft carriers and Royal naval air stations

Royal Navy displays new rescue method.

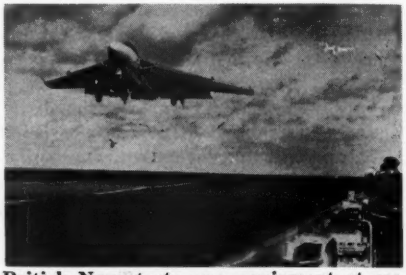
throughout the world. Over 100 successful practice rescue operations have been carried out from Royal Navy helicopters with the device.—News release.

'Hearing Aid'

A newly developed "hearing aid" will guide British Navy pilots to safe landings on the decks of carriers. The device supplements the mirror sight for carrier landings. The mirror sight called for the pilot to make his own decisions, keeping three lights in line as he let down through the darkness. The device on the carrier was watched so intently that the pilot could not check his air speed gauge. The new device gives him an electronic tone in his headphones that is varied according to his speed. These devices replace the landing signal officer who formerly guided the planes.—News release.

Test Landings

Being tested together by the British Navy are its new *D.H. 110*, the first 2-seat operational fighter to fly faster than sound, the new angled-deck on flattops,

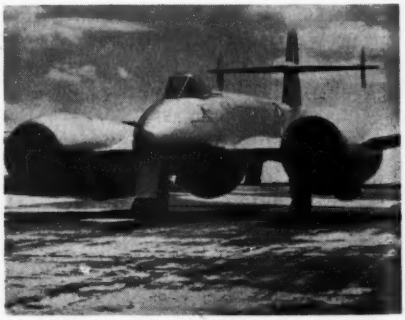


British Navy tests new equipment at sea.

and the new deck landing that is all done with lights and a mirror (MILITARY REVIEW, Jun 1954, p 69). The landing aid is expected to ease the problem of carrier landings for jet planes.—News release.

Vertical Thrust

An experimental *Meteor* is the first British plane to be fitted with jet deflectors, which, by throwing part of the jet thrust downward, allow the aircraft to



Jet deflectors aid landings and takeoffs.

take off and land in confined spaces. Although the use of deflectors has been revealed recently, the plane has been flying successfully with them for about a year.—News release.

WEST GERMANY

Coleopter

The *Coleopter*, a cross between the helicopter and a jet airliner, has been tested in wind tunnels and could fly in 2 years according to its inventor. It is designed to fly at speeds from 310 to 435 miles an hour and to land vertically in 30-foot-wide tubes inside a city. It is a tapered oblong jet with cylindrical wings, and has hinged passenger seats which remain upright whether the plane takes off vertically, flies horizontally, or backs down into the tube for a landing. The inventor claims that for military uses the speed could be increased to more than 1,240 miles an hour. It is also claimed that it could fly with or without a crew. The inventor, a German, built the first jet and rocket propulsion engines during World War II. He also discovered the value of nitric acid as rocket fuel, and his rocket cooling system and gas steam generator are in use throughout the world. The craft was designed to eliminate costly runways and long trips from cities to airports.—News release.

Exports

The export figures of the machine tool and machine construction industry showed the role played by West Germany in the industrial development of other Western countries. Of Germany's exports in 1954 valued at more than 1 billion dollars, more than 70 percent went to the countries of the European Payments Union. The principal buyers were Italy, France, Belgium, the Netherlands, and Luxembourg. In addition to machine tools, the exports included presses, power units, tractors, construction equipment, farm machinery, hoists, installations for steel mills and coal mines, and machinery for the production of paper, textiles, and food products. These figures do not include the export of automobiles, trucks, and electric equipment.—News release.

BRAZIL

Open Dam

A huge hydroelectric project near Salvador, designed to bring industrial development to an 8-state area of the country's backward northeast, was opened recently. The new 120,000 kilowatt powerplant will receive its water from a 4-mile long dam across the four arms of the lower Sao Francisco River. The power for new plants, electrified railroads, and farms will be carried over some of the longest lines in the world. The states to benefit are Paraiba, Pernambuco, Alagoas, Sergipe, Bahia, Rio Grande de Norte, Ceara, and Piaui.—News release.

CANADA

Joint Participation

Along with United States personnel, a team of approximately 60 Canadian officers and men participated in the recent series of atomic tests known as Operation *Teapot* conducted at the Atomic Energy Commission's Nevada test site. The small Canadian Army radiological defense group, with Navy and Air Force components, attended and conducted an exercise in a radioactive area for the purpose of training Canadian personnel. The United States Army co-ordinated the assistance given to Canada under this program.—News release.

Study Eskimos

Scientists of the Defense Research Northern Laboratory at Fort Churchill are studying the ability of the Eskimo to handle metal objects in subzero weather. Experiments have shown that an Eskimo can hold a piece of metal, that has lain indefinitely in the cold, in his hands for several seconds without freezing injury to the flesh. Normally, the white man's flesh will freeze instantly. Recently, 10 soldiers were sent to Fort Churchill to act as guinea pigs in this and other experiments.—News release.

NEW ZEALAND

Heavy Water

A bubbling hot spring in New Zealand will be harnessed under an announced plan and will play an important part in Great Britain's recently proposed chain of atomic-power electric stations. Under the agreement between the United Kingdom Atomic Energy Authority and the New Zealand Government, a power station in New Zealand will supply heavy water, a vital element in generating atomic power and also essential for hydrogen bomb production. The station will be located in the Wairekei district of New Zealand's North Island. Production of heavy water is expected to start late in 1957, and will be followed by electric power a few months later. The initial plant will produce 40,000 kilowatts of electricity and a useful tonnage of heavy water for nuclear-power reactors.—News release.

POLAND

Trade Credit

Communist Poland has been guaranteed a credit of 9.5 million dollars by the West German Government for the purchase of German capital goods. These exports will be in addition to the exchanges provided in the trade agreement for the current calendar year. Poland's exports under the agreement will be valued at approximately 38 million dollars, including 14 million dollars worth of agricultural products, and 5 million dollars each of coal and wood. West Germany will send goods worth about 35 million dollars, including 9 million dollars of iron and steel products and 7.3 million dollars of chemicals.—New release.

Ship Tools

Under a 3.5-million-dollar contract, a shipment of 25 machine tools was made by Poland to Argentina. The shipment included pneumatic hammers and other types of machine tools.—News release.

TIBET

Mineral Wealth

A survey of the mineral wealth of Tibet has been completed recently by geologists of Communist China according to reports. Traces of 30 valuable minerals, including iron, manganese, copper, lead, zinc, antimony, coal, oil, and asphalt were said to have been found. Samples of some of the minerals were taken to Peking for further examination. It is expected that mining work in Tibet will begin soon.—News release.

SPAIN

Develop Helicopters

The development of the *AC-13* gas turbine helicopter by a Spanish concern is nearing completion. The craft has a *Turboméca* Artouste shaft-drive engine in the fuselage behind its two seats. The jet exhaust from the engine is taken down the fuselage and turned through an appropriate angle before exhausting at the end to compensate torque. The plane uses a skid landing gear. In addition, the Spanish concern has developed the *AC-11* and *AC-12* helicopters. The *AC-11* was previously designated the *MC-101*, a prototype of which was flown in France in 1953. The *AC-12* is a direct development of the *AC-11* and has the same overhead engine position above the two occupants. The engine of the new plane, however, is a 150-horsepower *Lycoming*. It also has an entirely enclosed all-glazed cabin for the side-by-side seats. The plane's top speed is 81 miles an hour.—News release.

SWEDEN

Electric Power

A team of specialists has been sent to Sweden by the Ministry of Electric Power Stations of the Soviet Union to study that country's power system. A similar group of Swedish power experts has gone to the Soviet Union to inspect powerplants there.—News release.

JAPAN

Delivery Begins

Delivery to Japan of certain selected aircraft types to form the nucleus of equipment of a Japanese Air Force has been started by the United States under the terms of the Mutual Security Agreement. In the initial delivery, Japan received 59 planes, consisting of 35 *T-6* trainers, 8 *T-33* jet trainers, and 16 *C-46* transports. Under the present program, Japan will eventually receive 400 aircraft.—News release.

Miniature Rocket

The development of two miniature rockets, one only 9 inches long, capable of twice the speed of sound and reaching an altitude of 11 miles, has been announced in Japan.—News release.

NORWAY

Border Vigil

The organization of a special boundary commission with 60 men and officers is planned by the Norwegian Government to tighten its guard along the 112-mile boundary with the Soviet Union. The border has been closed since 1945 and a 1949 Norwegian-Soviet agreement on policing of the border expires in October. In the past only 24 Norwegian policemen have patrolled the Norwegian side of the boundary, however, the discovery that a Soviet spy ring had been active for years along northern Norway's Arctic coast prompted the new action according to the report. —News release.

SOUTH KOREA

Reserve Divisions

The activation of two new reserve divisions by South Korea has been accomplished with the help of the United States. According to the report, the South Korean Government plans to activate a total of 10 new reserve divisions with American aid.—News release.

FRANCE

New Claim

The Bonn Government has renewed its claim to the disputed coal-and-steel-rich Saar territory in an official notification of a change of policy to the French Foreign Office. The demarche insisted that about 960,000 German-speaking inhabitants would have the right to agitate for return to Germany after the German-French Saar agreement goes into effect. The agreement will "Europeanize" the territory under a neutral commissioner until a final treaty is written.—News release.

Health Statistics

An international method of recording diseases, injuries, and causes of death is being revised by health officials from 24 nations. The goal of the conference, sponsored jointly by the World Health Organization and the French Government, is the creation of a worldwide listening post to keep tabs on man and how he sickens and dies. The development of an international statistical method in tabulating medical history is a major step in world health. There is no basis for measuring improvement unless health officials know what is making people sick or killing them, and in what quantity. Under present classification, diseases, injuries, and causes of death are broken down into 999 categories. Classifications vary from injuries suffered on a tricycle to war deaths. —News release.

Mystere XX

The new *Mystere XX* fighter features a greater sweepback and thinner profile of the wings than the *Mystere IV*. It is powered by an *Avon RA 14* jet engine with a maximum static thrust of 9,460 pounds. It is designed for a speed of Mach 1.25 in horizontal flight. A single-seat version, the *Mystere XX B* and an all-weather model, the *Mystere XX N* are also planned.—News release.

FORMOSA

Additional Aid

An additional 48 million dollars is being turned over by the United States to Nationalist China's defense forces on Formosa. This sum, including 3 million dollars for technical co-operation, brings the total aid for Formosa since the beginning of the current fiscal year to 138 million dollars. This figure does not include military equipment or arms supplies. The money was made available from the special 700-million-dollar fund of the President of the United States for the support of forces of nations in the area of Southeast Asia.—News release.

BURMA

Sell Rice

Under contracts worth more than 15 million dollars, Communist China is to buy rice from Burma in exchange for cotton and silk goods, and food. It was reported that China would buy 150,000 tons of Burmese rice.—News release.

AUSTRALIA

Ration Pack

Preliminary research on a new food ration pack for the soldier stationed principally in a tropical area has been completed, and the pack is being tested by members of the jungle training center at Canungra, Queensland. The pack, a 1-man 24-hour ration, was designed for use where group cooking and feeding were operationally impossible.—News release.

TURKEY

Tungsten Deposit

Reserves of tungsten estimated at 5 million tons have been found in an area close to the summit of Mount Olympus near Bursa in northwestern Turkey it was announced recently. The deposit appears to descend to a depth of about 750 feet and the ore has an exceptionally high tungsten content of 5 to 10 percent.—News release.

USSR

Add Code Names

For simplicity of reference Soviet aircraft have been given code names by the Western forces (MILITARY REVIEW, Jan 1955, p 64). A more complete list of the names which have been allocated is now available and reveals that there are now five instead of three classes. To the original list of names beginning with *B* for bombers, *F* for fighters, and *C* for transports have been added *M* for flyingboats, and *H* for helicopters. New names are:

Fighters: *La9*, Fritz; *MiG-15*, Falcon; *MiG-17*, Fresco; *Yak-17*, Feather; and *Yak-23*, Flora.

Transports: *Li 2*, Cab.

Flyingboats: *GST*, Mop.

Helicopters: Mil design, Hare.—*The Aeroplane.*

Developments

Soviet fighter units in the Far East have been flying a Mikoyan all-weather design that is said to be a production version of the 2-seat fighter reported several years ago. Powerplants for this type are now given as two 5,720-pound thrust turbojets. Despite its relatively low output, the fighter is said to be very fast. Other equipment of the plane includes a radar unit in the nose; two 37-mm and two 25-mm cannon, and eight rockets carried under the wings; wingtip tanks; and aerial refueling gear. Production of this fighter started only recently, although 160 models are said to be in operation. Mass production of a new Soviet aircraft gas turbine, designed by Mikulin and capable of delivering 13,600- to 14,500-pound thrust has started recently at a plant in far eastern Siberia. A twin-jet medium bomber, in production since November 1953, is equipped with two Lulkov axial turbines of 14,000-pounds thrust each. They are half-buried in the fuselage sides and wing roots. Other models have pod-mounted engines.—*Aviation Age.*

FOREIGN MILITARY DIGESTS

Weapons of Mass Destruction

Digested by the MILITARY REVIEW from an article by J. M. Spaight in the "Journal of the Royal United Service Institution" (Great Britain) February 1954.

THIS article is not about the atom bomb. Enough, in all conscience, has been written on that tedious and unrewarding topic. The subject here dealt with relates to the *other* weapons of mass destruction which were mentioned in the official pronouncements of 1945-46 on atomic control. Hardly anything has been written on this subject, although it is one of the first importance. What are the pronouncements in question, and what are the weapons to which they refer?

There is, first, the 3-nation declaration on atomic energy made at Washington on 15 November 1945 by President Harry S. Truman, Clement R. Attlee, and Mackenzie King, which proposed the appointment of a United Nations Commission to make proposals, *inter alia*: "(*d*) For the elimination from national armaments of atomic weapons and of *all other major weapons adaptable to mass destruction.*" Second, there is the Resolution of the General Assembly approved in London on 24 January 1946 which in section 5, paragraph (*c*), requested the commission which was to be established to make specific proposals for the elimination of the weapons referred to in the declaration, the relevant terms of which were repeated.

Justifiable Mass Destruction

"Major weapons adaptable to mass destruction": What are they? They were not defined, and the expression is not an altogether happy one, in part because it is vague and because it seems to imply a general condemnation of the weapons in all circumstances. That would be to go too far. The use of weapons of mass destruction is perfectly justifiable and indeed a military necessity in certain circumstances. An assault that is massive must be resisted massively if the defense is to hold. To put as many of the enemy troops and as much of their matériel as possible out of action should and will inevitably be the aim of the defenders. It is horrible, but one has to face the hard facts of war; the mass production of corpse and clinical cases is the prime object of the defense when a big invasion has to be hurled back. It is illogical to condemn massiveness in the one case

and not in the other. Massed armies, massed fleets, or, for that matter, massed air formations, might equally be banned, and the ban would be as useless and as much a dead letter as would be one on the use of mass destruction weapons as a countermeasure.

The weapons of mass destruction which are in question are, it might be suggested, only those which are *ejusdem generis* with atomic weapons in this respect, namely, that they produce a toxic effect. There are, however, only two kinds of weapons which have such an effect: poison gas and bacteria. Both are dealt with in an existing convention, the Geneva Protocol of 1925. Nothing new in regard to the use of either arose in World War II, and it is a reasonable assumption that it was something which did then arise that was in view in the tentative proposals of 1945-46. The authors of those proposals can hardly have been referring back to matters which were then rather ancient history, and in regard to which no difficulty had been experienced in the war just ended.

Urban Conflagrations

It is evident that what they had in mind, or at any rate, should have had in mind, was the use of weapons capable of producing disasters comparable in magnitude to those which overwhelmed Hiroshima and Nagasaki, and of doing so in a comparable situation—the situation in which a large center of mixed population is devastated, not one in which, for instance, a great battleship is blown to pieces by a submarine mine. From another angle, the analogy which suggests itself is that of a great natural convulsion. In the earthquake at Messina in 1908, about 80,000 to 100,000 people were killed or burned to death; in the Japanese earthquake of 1923, about 100,000 similarly lost their lives. If by major weapons of mass destruction those are meant which can produce a comparable casualty list, there are candidates besides the atom bomb which qualify for inclusion. In Tokyo, on the night of 9 March 1945, about 83,000 people perished; this was entirely a fire-bomb attack. The fatal casualties in Hamburg at the end of July 1943 numbered about 60,000; high explosive and incendiary bombs were used in this case. Man, it seems, has succeeded in fashioning for himself major agencies of destruction as bad as nature's worst.

Another suggestion which has been made is that what has to be prohibited and prevented is the use of weapons which are in fact, although not admitted to be, instruments of deliberate *genocide*. This is a hybrid word which was used in World War II to denote the destruction of a nation or of an ethnic group. Originally applied to the attempt of the Nazis to wipe out the Jewish race, it has been extended, not altogether appropriately, to the realm of air warfare. One finds, for instance, an American writer speaking of "random extermination (genocide)" by air bombing. Another writer, Australian this time, has pointed out that when Operation *Pointblank* began and area bombing was conducted on a great scale, Goebbels was able to contend that "the Allies were anxious to destroy not only Germany's military power but the very livelihood of her people. This, he could maintain, was the Morgenthau Plan in action." To try to destroy the industrial population of a country would be, in effect, to adopt a program of genocide, but, as applied to an entire country, such a policy would be a very foolish one. It simply could not be carried out. The physical means of destruction would not be sufficient. If, however, the limited kind of genocide—if it could be so called—which heavy attacks on large and mixed agglomerations of the enemy people would represent is what has to be dealt with, the remedy is not the elimination of a weapon of mass destruction but the agreed discontinuance

of a particular mode of aiming—or, perhaps, one should say not aiming—bombs. The question comes back, in fact, to the problem of the use of high-explosive and, more particularly, incendiary bombs for blanket attacks on towns and cities. The urban devastation in World War II was due to a far greater extent to fire than to explosion. About 75 to 80 percent of the damage to German cities was so caused. The fatal civilian casualties due to air attack were greater in Japan—330,000—than in Germany—305,000—and the principal cause of them was burns.

Incendiary Bombs

It is not generally appreciated that World War II began, so far as it was war in the air, as one of high-explosive bombing and became, by degrees, one in which incendiary bombs were used to an even greater extent than explosive. The war took on an almost medieval quality; instead of heretics or witches, cities were burned at the stake. How quickly and enormously the use of fire-bombs increased can be judged from the statistics of production in Great Britain. In 1940 and again in 1941, *no* incendiary bombs at all were produced. In 1942, production was 52,373 tons; in 1943, 102,138 tons; and in 1944, 106,740 tons. The United States Army Air Force also used incendiary bombs to a greater and greater extent as the war progressed.

According to Lieutenant Colonel Randolph in his book, *48 Million Tons to Eisenhower:*

By the end of the war in the European Theater of Operations, an average mission carried as many incendiary bombs as had been sent over from the United States in an entire year at the beginning of the war against Germany.

Here one comes to the concrete problem, and it is an important and difficult one. It is mainly the problem of the incendiary bomb. To suppose that it can be solved in the same way as that in which it is proposed that the atom bomb should be dealt with is to ignore the basic difference between the one kind of weapon and the other. Incendiary bombs are not made of rare materials, as are atom bombs. They are compounded of comparatively common ingredients, procurable without difficulty almost anywhere: magnesium, thermite, petroleum, and phosphorus. They could be readily produced in war. The production of them in peace could not be controlled effectively by any international authority short of one that would be, in effect, a world government. We are a long way from a government of that kind yet. Meanwhile, what can and should be done is to try to regulate the manner in which incendiaries are used.

A False Analogy

It is a pity that in the 3-nation declaration of November 1945, and the United Nations Resolution of January 1946, atomic and other mass producers of destruction were bracketed as if all such weapons were alike and could be included in a common formula. They are not all alike, although they have some similarities. Gas and bacterial weapons are in some respects akin to atomic, and for them it might be, but is not necessarily, a question of "elimination" from armaments. The position in regard to other potentially mass destruction weapons is not the same. There is, in fact, no true analogy. For military and defense reasons they cannot be eliminated. All that can be done is to try to accomplish in a different way the purpose of elimination, which, after all, is simply to prevent the use of a method of war which shocks humanity. Either the statesmen responsible did not appreciate the difference that was involved, or they thought it would be impolitic to draw attention to it and thus, perhaps, to revive memories of some unhappy features of Allied bomb-

ing practice in the last war. But, in truth, one cannot understand the why and wherefore of much that was done in this field since August 1945, or, for that matter, of a good deal that was left undone when it might well have been done. The historians of the future will be puzzled by, or will wax cynical about, the conclusion of three new Geneva Conventions in 1949, and the failure of the governments who agreed to them to do anything to regulate some methods of war which, if continued, will make the humanitarian provisions of those Conventions read like hypocritical nonsense.

The issue is a simple one. It is whether air bombardment should be made the subject of a restrictive international agreement. Bombardment by naval and land forces has been. Why cannot air bombardment be dealt with in the same way? Because, say the objectors, that way of dealing with such matters is out of date; it is not enough merely to prohibit some weapon or method of war; you must go on and organize an international system of control to ensure that the prohibition will be observed. In other words, the Geneva and Hague Conventions are of no practical value. The war criminals who were brought to trial in Germany and Japan would hardly have agreed with that view. They found the Conventions, so far as they proscribe certain acts of war, to be by no means a dead letter. The terms of them were the basis of, and were cited in, the indictments.

A Charter

What is needed is an express agreement that air bombardment must be confined to military objectives, the general nature of which should be defined in the agreement—this should present no great difficulty—and that the practice of making a center of population as a whole and not any specific military objectives in it the aiming point, that is to say, target area bombing in its more uninhibited form, cannot be considered to be in accordance with this rule. A regulation of this kind could not consistently be objected to by the states which were the major belligerents in the last war. They affirmed at the beginning of the war their intention to restrict air attack to military objectives. By degrees that self-denying ordinance came, in effect, to be set aside. On more than one occasion the Old World heart of a historic town, containing no military objectives, was deliberately burned out in the hope that the fires spreading from the center would creep outward and consume also the outlying part which was the factory belt. No one acquainted with what happened in the war can be unaware that such things did happen. They could only be regarded as contraventions of the principle of the military objective; but, alas, that principle had never been embodied in an international agreement regulating air warfare. The omission should be made good before another great war comes. There should be a kind of "Charter for the Cities," giving them a limited protection, giving them so much immunity from danger as the necessities of war allow, trying to keep them from being turned into Sodoms and Gomorrahs, not trying to do the impossible but merely, in effect, what was done in the naval bombardment convention of 1907. That convention ruled out blanket bombardment from the sea. Why not from the air? After all, it is only to ask that bombs, like shells, should be placed where they will hit the mark and do the most good. By and large the naval rule has been observed, although there have been one or two contraventions of it.

Soviet Long-Range Missiles

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APPROXIMATELY 800 years ago, Chinese warriors bound small paper tubes to their lances and arrows and, in addition to a terrifying piece of fireworks, they also achieved considerably greater ranges with these weapons. The rocket principle is, therefore, no modern innovation.

In contrast with all other projectiles, the rocket is a projectile whose movement is not imparted to it from without, but is developed from within its own self by means of reaction. All weapons of this type reported in military history were propelled solely by means of charges of powder.

Since, however, a number of discoveries, which are vital in the employment of modern military rockets but which were reserved for a later era, had not yet seen the light, their role as useful weapons came to an end for the time being around the middle of the nineteenth century.

Only after the scientists, Goddard and Oberth, had conducted extensive research in the field of liquid propellants was a new type of rocket born in 1931 that may be regarded as the progenitor of all subsequent "operational" long-range rocket missiles. On 14 May 1931, on the Dessau drill grounds, occurred the first actual launching of the liquid fuel rocket, which had been constructed by the engineer, Johannes Winkler.

A year later, at the command of the Reich Defense Ministry, experiments began and were followed in 1933 by the systematic development of the rocket to a stage where it became a modern weapon of war. These experiments, which were conducted under the direction of Doctor Dornberger, finally culminated, during World War II, on the one hand, in the projectiles of the German *Nebelwerfer* (rocket launchers) with a powder propellant and, on the other, in the *A-4* liquid fuel rocket of Doctor von Braun which later was to become universally known under the name of the *V-2*. Today, rockets are being developed in various countries—the United States, the Soviet Union, England, France, and Switzerland—as antiaircraft weapons and as armament for planes. The great powers of the world have, however, been engaged for several years in creating a weapon of destruction based on the early German weapons. As a result, it is indicated that Western Europe would be seriously threatened by Soviet long-range rockets if war were to break out.

German Missiles

When the bombers of the Anglo-American Air Forces were producing increasingly great devastations in the German areas, and our own Air Force was no longer capable of replying in corresponding strength, the thought was born of achieving an equalization of strength by means of the employment of completely new types of long-range missiles.

As a result of research, two types were finally put into use: first, the flying bomb, *V-1*, and later, the long-range rocket *V-2*. At the time of the heavy attacks of the Royal Air Force on the Peenemünde research center in August 1943, during which the formations dropped 12,000 tons of bombs of all sizes, the new weapons were already being manufactured at various places in the Reich.

Although these weapons, which later became so well known, could not be designated as "perfected," their degree of development was such that they were at least usable. Although, at this stage of the war, their employment could not change its out-

come, it did, nevertheless, change the physiognomy of all future wars.

After the destruction of Peenemünde, the Ministry of Propaganda suddenly began to "broadcast" to the entire world that Germany was in possession of great quantities of wonder weapons of unheard of efficacy. This action is difficult to understand, from any point of view, for the chief value of any new weapon resides in the surprise resulting from its unexpected employment.

The Flying Bomb

This new type of weapon was a counterpart of the marine torpedo. That is to say, it was a tiny plane which was self-propelled and automatically steered and held on a straight course at a predetermined height by means of a piloting mechanism. It was propelled by a so-called pulse jet motor which, in contrast to the rocket, made this weapon dependent on the atmosphere. The energy required for the operation of this jet motor was obtained by a combustion process utilizing gasoline and air. Attached to the body of the missile were wings with a span of about 18 feet.

The normal range of this flying bomb—named by Goebbels, *Vergeltungswaffe 1* (Retaliatory Weapon 1) or *V-1*—which was 26.5 feet long, was 149 miles. The longest observed flight was 174 miles.

In the forward part of its body, the *V-1* carried a special explosive charge of 1,848 pounds—the effects being equivalent to those of a 2,200-pound aerial mine. In spite of its flying speed of 385 to 466 miles an hour, experience showed that it was easy to shoot down because the steering mechanism was able to hold the projectile only on a straight course.

The battle against England's principal city began on 12 June 1944 and ended on 30 August of the same year. At this time, the last of the starting ramps on the "rocket coast" were in the hands of the Allied forces.

Out of the total of 8,070 of the flying bombs launched against England, only 5,964 reached the British Isles. Of these, again, 24 percent were brought down by fighter aircraft, 17 percent by antiaircraft artillery and multibarreled rocket units, and 5 percent by the balloon barrage. The 2,000 flying bombs that hit London itself, destroyed, according to Churchill's figures, a total of 24,491 houses, made an additional 32,293 uninhabitable, and damaged an additional 950,000. Available data show 5,864 persons to have been killed, 17,197 seriously wounded, and 23,174 slightly wounded. Authoritative German sources reported 24,000 houses destroyed but gave considerably higher figures for the dead and wounded.

Long-Range Rocket

The first liquid fuel rocket of the German Wehrmacht, constructed in 1933 in accordance with the plans of Doctor von Braun, was designated *Aggregat 1* (missile number 1) or *A-1*. This model was followed in 1934 by the *A-2* and in 1938 by the *A-3*. The first large rocket designed by Braun in 1939 and constructed in 1940 was naturally designated the *A-4*. Not until the latter was being constructed in large quantities was it given the name of *Vergeltungswaffe 2* (Retaliatory Weapon number 2) or *V-2*.

This rocket was approximately 46 feet long and had a weight of 28,000 pounds of which 17,600 pounds were represented by fuel and about 2,200 pounds by the explosive charge. The latter consisted of amatol in the so-called "warhead," and its explosive effect was fully equal to that of a 2,200-pound aerial mine.

The required energy was obtained by the combustion of alcohol with liquid oxygen. The average range of the *V-2* was close to 200 miles. Its speed was 5,084 feet per second.

After it had started, the giant 46-foot missile at first rose vertically, then, begin-

ning with the ninth second of its flight, its course was deflected away from the vertical so that at the end of the fifteenth second, it was traveling upward at an angle of 45 degrees in the direction of the target approximately 186 miles away. The motor continued to operate until the projectile had attained its maximum speed. It was then shut down—that is, no more fuel was fed to it so that the missile was now carried by its own momentum, like the usual projectile. After reaching a maximum height of about 60 miles, experience revealed that, because of its large stabilizing fins, a very steep angle of descent resulted as soon as the missile reached the denser layers of atmosphere.

Since, at the same time, a great deceleration occurred, due to the resistance of the atmosphere, the *V-2* finally struck the surface of the earth in an almost vertical descent at a speed a third of the maximum it had reached in its flight. Since its approach could not be detected under these conditions, the British were obliged to accept the fact that no defense was possible against this "lightning out of a clear sky."

In contrast to the *V-1*, which represented a provisory weapon hurriedly developed by the Luftwaffe, the *V-2* rocket constituted the continuation of research that had been started even before the war.

It was due, however, to the stubbornness of Hitler that 2,000 of these missiles per month were not being turned out as early, even, as the spring of 1943.

The total number of the *V-2* projectiles which landed in England was 1,500 according to the figures of Doctor Dornberger, the chief of the *A-4* program. The battle against England with long-range rockets began on 8 September 1944 with the attack on London and ended on 27 March 1945. The total number of those killed by the *V-2* projectiles was 2,754 according to English figures, and the number of wounded, 6,533. Here again, the actual losses must have been considerably higher. As regards the material damage, we unfortunately have no data. The majority of the rockets which landed on London were fired from the vicinity of the Hague in the Netherlands.

During the heavy defensive battles on the western front, altogether 3,000 of these projectiles fell on the Allied supply port of Antwerp. Finally, the last employment of these rockets occurred—and this was the only time they were employed in the tactical framework—against the American forces at Remagen. The famous bridge was destroyed—although not until General Patton's tanks had crossed the Rhine.

Soviet Application

After the capitulation of the German Wehrmacht, all the important material that had a bearing on the development of rocket weapons fell into the hands of the Western Allies and the Soviet Union.

While, for example, only 100 complete *V-2* missiles remained for the Americans, 62 of which were later fired on the White Sands range, the Soviets not only received complete rockets of every kind, together with the servicing equipment for them, but also, in addition to the plans which they themselves seized, all data relative to German rocket projects that had come to the knowledge of the Western experts. This "friendly aid" on the part of the West, at that time, finds its explanation in the agreement between the two groups at the end of the war, which provided for mutual inspection of all projects of this nature. Even the fact that the majority of the experts are now working for the West must not blind us to the danger which threatens from the East. Among those working for the West are the world-renowned scientists Dornberger, Von Braun, and Ley. As a result of their labors, extremely effective weapons of this type are already in mass production. Since the beginning of the Korean crisis, work has been pursued with redoubled energy by both sides.

A portion of the Peenemünde research staff, including Doctors Fröhlich and Scheinost, Certified Engineer Waldmann, and Engineer Erich Müller, as well as many of the other scientists who formerly worked there, have for years been in the service of the Soviet Union.

The interrogation of those scientists and technicians, who had been working on the future plans for German rockets and guided missiles, must have been of particular value, for all individuals, including prisoners of war, who were suspected of having had anything to do with the production of *V*-weapons, were sent to Moscow.

Although the German experts found a rich field of activity in the United States and England and in collaboration with the research workers there, have been able, since that time, to achieve notable results, the fate of our countrymen in the service of the Soviet Union was veiled in darkness for a long time.

Not until 1952, did the Soviet Union make known that her technicians, supported by German experts, were intensively engaged in the development of large rockets. One of the greatest scientists in this field, Doctor Tikhonravov, a member of the Moscow Military Academy, has expressed himself to the effect that the Soviets are already quite capable of constructing space ships with which flights into interplanetary space have now become a thing of the near future. As is well known, the Soviets have been working for some time on the problem of the creation of an artificial terrestrial satellite.

Let us first turn our attention, however, to present happenings. The fact that the Soviet Air Force had deteriorated to a state of practical insignificance by the end of the war but, in the years since that time, has risen to the point where it has become the world's second most powerful air force, is without question to be attributed to the capture of units from the German Luftwaffe. Thus, in addition to a number of important constructions in the field of jet propulsion, the *ME-163* or *JU-248* rocket fighter, which had been used in Germany for the protection of vital targets, also fell into the hands of the conqueror. Its maximum speed was about 620 miles an hour and its climbing rate was 32,800 feet in 3 minutes. The improved Soviet copy is known by the type designation of *JAK-21*.

It must be added that in addition to the completed plane, the engineers and the manufacturing establishment for the plane bodies and motors also were "taken."

The situation is quite similar in regard to rocket construction. Let us mention here only the names Peenemünde and Nordhausen—those places where the terrifying German long-range weapons were developed and constructed. Although certain conditions such as completely free scientific research or the presence of a highly qualified industry for the manufacturing of precision apparatus and electronic equipment are lacking, it is noteworthy that, since that time, the Soviet Union has become the greatest producer of military aircraft and, in addition, is challenging the position of the United States in atomic research and, finally, is turning out large rockets on an enormous scale. Except for primitive rocket planes, the *IL-Stormovik*, and a rocket launcher, the Soviets had nothing to offer during the last war. Even their rocket projectiles, driven by a powder charge, were greatly inferior to those of our German *Nebelwerfer* in point of effects and dispersion error.

This situation has changed considerably, however, as was shown during the fighting in Korea, for both improved unguided as well as guided missiles were employed in that theater of operations. In Indochina, during the bombardment which preceded the attack of the Vietminh forces in the fall of 1952 on the

French advanced post of Phuo-Hoa, even long-range missiles of the German *V-2* type were fired, and there could be little doubt of the identity of the country in which they were built.

There exists, today, in the Soviet Union, a separate commander for rockets and long-range missiles whose functions are being exercised at the present time by General Yakolev. It is assumed—according to official American reports—that the Soviets are manufacturing missiles of the *V-2*, *V-3*, and *V-4* types.

Although these designations do not correspond entirely with the German designations, it could be assumed that they were Projects *A-4*, *A-9*, and *A-10*. During the final years at Peenemünde, three different types are said to have been in the process of development. The supposition that it is, perhaps, the German types that are meant receives a certain degree of confirmation in English and American sources. In July 1953, the former British Air Minister and present assistant to Arthur Henderson reported to the Lower House that the Soviets were producing annually 24,000 supersonic rockets modeled after the *V-2* type.

It is likely that the improved *V-2* is the *A-4b*. Henderson also added to his report that a Soviet long-range transcontinental rocket with a range of 2,500 miles was being constructed. An American report gave virtually the same information but spoke, however, of only 1,850 miles.

The *A-9*, of which only a few were constructed, was reportedly not powered by alcohol and liquid oxygen, but by other propellants. The *A-10*, designed as a first stage rocket, would have possessed a weight of 85 tons, but was never constructed. With the 2-stage *A-9/A-10* rocket, which was designed to cover a distance of 3,000 miles and which, because of the target for which it was constructed, was named the *America* rocket, at least the limit of the upper atmosphere would have been reached.

In what way the Soviet Union has made use of the possibilities of an improved form of *V-2* will, for the time being, remain conjectural, only. It is certain, however, that an improved form of this rocket with a range of approximately 435 miles exists, which renders an attack on West Europe possible at any time. Let us, therefore, not make the mistake of underestimating the Soviets in this domain.

Production and Launching Base

In connection with information from East Germany in 1952, telling of an annual production of 2,000 *V-2* missiles, the recent statements of Germans who have fled the Soviet zone and who profess to have seen rockets of this type with sweptback wings over the Peenemünde testing grounds, are of particular interest. Reports of this type sound entirely creditable especially since it is known that even during the war, technical improvements were planned which would have resulted in a considerable increase of performance but which could not be realized due to lack of industrial reserves. This was especially true with regard to the improved form of the V-2, which, outwardly at least, corresponds to the projectile described.

The German *A-4b* Project provided for the attachment of airfoils to the body of the rocket in order that the latter, as it dives down from a great height and enters the atmospheric blanket, will be able to assume a gliding course by which the range would have been raised to about 435 miles.

In addition to the former testing station of Peenemünde, which appears to have been reconstructed, the subterranean installation of the *Mittelwerk* Incorporated, between Niedersachswerfen and Nordhausen, fell into the hands of the Soviets. According to reports, this estab-

lishment is again in full operation and engaged in the construction of long-range rockets. This report also sounds entirely creditable in view of the fact that all productional means had to be handed over to the enemy at that time.

The question now arises in this connection concerning the existence of Soviet rocket launching sites. Although we are not able to obtain any information concerning such launching sites in the interior of the Soviet Union, nevertheless, the reports that have been received of late, permit, to a certain extent, reliable conclusions concerning such installations on East German soil. Here, the center of *V-2* manufacture and testing is, apparently, mainly in the Peenemünde area, but installations are also found in the Rüsterort and Kolberg areas, on the Frische and Kurische Haffs and up to the vicinity of Memel, at Nordhausen on the Harz, and at Erfurt in Thuringia.

Test launchings over a year's period from the Kolberg district in the direction of Ösel and Dagö Islands, which belong to Lithuania, gave ranges of about 435 miles. The trajectory of these large rockets, pivoted at their launching sites in the region between Pomerania and Livonia and swept over the Ruhr district, could give rise to very considerable and serious destruction.

Particular significance attaches to the aforementioned tunnel installation of the *Mittelwerk* Incorporated at Nordhausen which, constructed as an underground manufacturing base in the border region of the Harz, served in the manufacture of *V-1* and *V-2* weapons.

This plant, which had to be turned over in an undamaged condition to the Communist adversary, may be regarded as the most advanced and secure supply base for Soviet rocket weapons. Regular and abundant supply of the launching sites around Erfurt presents no difficulties whatever from this location. In addition, it makes possible regular supply of Communist rocket units in case of an eventual attack toward the west.

Disregarding the ranges of 1,860 and 2,480 miles given in the American and British reports and assuming only those of 435 miles, a distance that would certainly be covered, there would still be no pleasant prospects for Western Europe. The arrangement of all known launching sites reveals a thoroughgoing defense plan but, on the other hand, would appear to be entirely suited for offensive warfare.

Of the rocket launching sites located in satellite states, those in the Pilsen and Hradec regions are of particular import. In his excellent work, *The Defense of the West*, Captain Liddell Hart discusses the Soviet airborne forces which, in his estimation, in case of an attack on Western Europe, could constitute a great and very unpleasant surprise for the British Isles. As Utopian as it may sound at the moment, it may be added that the transportation of such land forces in large rockets in the future is a possibility that cannot be completely brushed aside.

Special Warheads

Disregarding the two atom bombs dropped in Japan which put a sudden end to the military operations in the Far East, neither bacteriological nor chemical means were employed in World War II. Whether the consideration that these infernal weapons would lead only to mutual destruction without any benefits deriving from them would lead to the same hesitation in their employment, remains to be seen.

We shall not go any further into the subject of the effects of, and defense against, atomic, bacteriological, and chemical means in this article. In an eventual conflict between West and East we must, however, count definitely on the use of

rocket weapons by both sides, and it will be immaterial whether these are used as the carriers of atom bombs or are used with an atomic, bacteriological, or chemical charge in their warheads.

Even the usual *V-2* should be able without difficulty to carry an atomic charge in its tip equal to that of the 280-mm shell of the American atomic gun. The detonation of a projectile of that type produces the effect of twelve thousand 105-mm shells fired at the same time on the same target.

The very existence of long-range rockets or of the destructive combination of long-range rocket and atom bomb binds the nations of the West to institute thoroughgoing preventive measures on a common basis. In this connection, the establishment of so-called security zones in which mothers with small children and sick and old persons could find refuge is of especial importance. In view of the "Sword of Damocles" that is hanging above them, it would seem to be the injunction of the hour that the responsible statesmen of Western Europe finally perceive the seriousness of the situation and vigorously act to achieve political, economic, and military unity.

The Future of the Bomber

Digested by the MILITARY REVIEW from an article by Squadron Leader T. N. Ghadiok in the "Indian Air Force Quarterly" October 1954.

THE bomber played a very important part during World War II. It contributed to the fight for air superiority in that strategic bombing attacks on Germany's military, industrial, and economic targets made it difficult for her to continue the war.

Toward the end, Germany started using rockets and flying bombs as strategic weapons against Great Britain. Although these weapons did not cause much damage, they certainly brought about a revolution in weapon development. After the war, research to perfect these weapons started. How these new developments will affect air warfare no one can tell.

Whether nations will continue to use the strategic manned bomber in this role or switch over to some kind of controlled missile, is anybody's guess. However, the first step toward finding a clue to the future is to weigh the advantages and the disadvantages of one against the other.

The standard weapons of the United States Strategic Air Command are the heavy bombers, *B-36*, *B-47*, and *XB-52*. Their contemporaries in Great Britain are the *Valiant*, *Victor*, and *Vulcan*. Some of these aircraft are still in the experimental stage. The English *Electric Canberra*, medium bomber, is, however, in service with the Royal Air Force.

There are two types of controlled or guided missiles:

1. Guided projectiles like the *V-2*.
2. Winged projectiles like the *Matador* and the *WAC Corporal*.

The guided projectile carries its own fuel and oxidizer. It reaches very high altitudes and then descends toward its target. The major part of its flight is at supersonic speeds at altitudes where air density is almost nil. Major developments in the field of missiles have been concentrated on this type.

The winged projectile contains the high trajectory aspect of the guided projectile during the major part of its flight

with a flat path of aircraft at lower altitudes when nearing the target.

Performance

The invention of the jet engine has increased the bomber's performance much beyond the capacity of the piston engine. The size of these aircraft has also increased. A modern bomber is capable of flying at sonic speeds and carries a bombload nearly four times that of the bomber used in the last war. To illustrate the point, the *B-36* has an internal space of about 18,000 cubic feet which is equivalent to three 5-room houses. During one of the recent tests, this aircraft flew 12,000 miles and dropped 84,000 pounds of bombs, remaining in the air for 51 hours. The *XB-52* has a speed of over 600 miles an hour and a range of 8,000 miles. The speed of the *Valiant* is over 600 miles an hour at 55,000 feet.

The guided missiles used during World War II were short-range weapons. The range of the *V-1* was about 150 miles and that of the *V-2* about 225 miles. Since then, development has been going on toward improving the range of the missiles. This is achieved by launching one rocket from the other in flight and is known as the step system. Several steps can be used which drop off as soon as they exhaust their fuel and impart their impulse to the step ahead. In this way no dead weight, in the form of tanks and motors, is carried a moment longer than necessary, thus increasing the range. Another method of increasing the range of a missile is by firing it from a ship or submarine.

Germany expected to increase the range of her *A-9* winged projectile to 3,000 miles by stepping it with a 68-ton booster unit. The United States is working now on this rocket and has constructed the *WAC Corporal* missile on a simple step rocket. The range of this missile is still a secret but in one of the trials at White Sands, it reached an altitude of 250 miles. The speed at which these missiles approach the target is also a secret but the guided projectile of today is certainly faster than the *V-2* which attained the speed of about 3,500 miles an hour. Whether such a missile has already been flown behind the Ural Mountains or not is difficult to say.

Control

A conventional bomber is flown by its crew, whereas the guided missile is controlled by an observer or a team of observers hundreds of miles away. Generally speaking, there are two methods of guiding a missile over long ranges by the electronic system and the fully automatic system.

Electronic control of a missile in flight is exercised by a distant observer using radio or radar. With this method the range of operations is limited to a maximum of 400 miles depending upon the altitude of the missile. Another electronic system, using ultra short waves, was developed by the Germans during the war. This is called the "Radar Beam Riding System." Postwar improvement of this system is the monitoring of the missile by a locked microwave beam from high altitude aircraft serving as a relay link several hundred miles from the target.

The fully automatic missile is equipped with means of finding its own target. The missile is fired in the direction of the target and its original path of flight is maintained by automatic stabilization. The central organ for this is the gyropilot which registers deflections in the attitude of the missile. These impulses are transmitted to the stabilizing surfaces or vanes which are either exposed to the free air stream or located within the propulsive exhaust jet. These missiles use radar, light, sound, or magnetic emanations to find their objectives.

For effective bomber operations, correct navigation is essential. The fuel consumption of a jet bomber, which seems

unlikely to be overcome in the immediate future, makes it vital in any long-range operation. To achieve this accuracy, radio and radar navigational aids have to be continuously developed and proficiency attained in their use. At the same time, a high standard of navigation on the part of the crew, when range or other considerations make this necessary, is a vital requirement.

The navigation of a missile is easier as it is navigated from the ground. The electronic control of the missile ensures accurate navigation although it is vulnerable to electronic countermeasures. This difficulty does not arise in the case of a fully automatic missile. The latter is, however, susceptible to considerable errors because of the difficulty of forecasting wind speeds along its route. The magnitude of this error is, usually, proportional to its range.

Bombing Accuracy

Bombing accuracy is, above all, the key to the maximum effectiveness of bomber forces. If the bombing error is not reduced to the absolute minimum, all other efforts are of doubtful value. Results of Allied area bombing in the last war showed that the accuracy obtained in these attacks was extremely wasteful against normal targets such as industrial works or factories. The targets of the future may be small and isolated and would, therefore, demand pinpoint accuracy in bombing.

The increased speed of the bomber and great altitudes at which it will have to fly create serious problems for accurate bombing. The aircraft would complete its bombing run in too short a time to allow the bombardier to make any last minute alterations in sighting. From these heights the target would appear too small and might easily be lost to sight. Above all, the bombsights available at present have their own limitations, for example, a height of 25,000 feet and a speed of 300 knots.

The Navigation Bombing Computor, fitted in the *B-36*, and the *H* system are the latest developments on bombsights. However, further improvements will be necessary to meet the requirements of faster aircraft.

The missile war against London and Antwerp proved the inaccuracy of the projectiles which existed at that time. A total of 2,000 rockets crossed the English coast and 1,230 of them crashed into the London area, a radial error of 4 percent of the range. This error was much more than that of bomber raids over Germany.

The missile bombing presents considerable difficulties because of the problem of target identification. One factory or one built-up area is very much like the other. Although much has been done to improve bombing accuracy of the missile, it is doubtful if it will be possible, for a long time, to produce a device which will enable the missile to select and home onto a land target. Homing onto a ship is comparatively easy because of the absence of any other similar object in the immediate vicinity.

Production Facilities

The modern bomber is an extremely complex machine. The production of aircraft, bombs, and armament involves heavy machinery and requires highly skilled engineers. Each major part like the engine, the fuel tank, the undercarriage, and the gun turret is built in huge factories which are dependent largely on many other small industries. If any of these industries were knocked out, the aircraft production would receive a great setback.

The component manufacturing machinery necessarily needs to be located in large industrial centers. The aircraft factories must be situated on airfields with long runways for purposes of test flights and the eventual dispatch of air-

craft. Huge hangars and other buildings form a necessary feature of these factories.

The methods of large-scale missile production are much simpler. The *V-2* components and subassemblies were manufactured in small factories and workshops dispersed throughout Germany and occupied countries and required only a limited aid from other industries. The parts were finally brought together at central assembly halls. One of these assembly centers was situated inside an old salt mine with tunnels extending for almost a mile.

The cost of modern bombers is fantastic. A *B-36* costs about 3.5 million dollars. The missiles are far cheaper to produce.

Operating Requirements

In addition to the high cost of producing a bomber aircraft, there is the recurring cost of its maintenance throughout its operational life. A *B-36* requires about $182,000 for replacements—mainly for engines—during a single year. A further expenditure on guns, ammunition, and other defensive armament is inherent with the bomber. The missile, being an expendable item, does not incur any expenses on maintenance or defensive armament.

The crew of a bomber requires extensive training which costs a great deal of money. A pilot needs vast experience in flying and has to undergo more than 2 years of specialized training to be able to command an aircraft like the *B-36*. The ground crew requires a high degree of technical knowledge and skill to service and maintain the complicated machine with its ever-increasing variety of complex electronic equipment and radar sets. These engineers have to be given technical training which requires both time and money.

On the other hand, the missile is a weapon of light engineering. There is hardly any precision work in its design. Personnel of low technical grade can operate it. The United States missile manufacturers are of the opinion that an average soldier, without any technical knowledge, could be trained to fire a missile. Also it does not need any maintenance.

The safety of a bomber throughout its flight is of primary importance. It requires the assistance of meteorological stations for weather data and radio and radar stations for accurate navigation. Compared to the bomber, the missile requires very few ground aids as it is independent of weather conditions.

Air Superiority

Air superiority is essential for the success of all operations. It has to be achieved and maintained throughout the area of operations. Its achievement requires the destruction of the enemy's airpower and the production capacity behind his airpower. This involves extensive offensive operations which the bomber alone can carry out. The missile cannot contribute much toward achieving air superiority because of its inaccuracy in hitting small targets which may necessarily be of major significance to a nation's airpower.

Mobility

The Germans claimed that the *V-2* had revolutionized one of the principles of air warfare because it could operate in the face of hostile air superiority. This was a fallacy because only air superiority could ensure that the places where missiles were stored, serviced, and fired, the crews who fired them, and the vehicles which carried them, would not be subject to systematic interference.

Although the modern strategic bomber can operate at much greater ranges than the bomber of the last war, its range is still not enough to cover all targets in

the enemy territory. This difficulty can be overcome either by flight refueling or by operating from forward bases. The former course has serious disadvantages. First, the number of sorties is reduced and, second, the navigational and bombing aids dependent upon transmission from friendly territory becomes increasingly inaccurate. At any rate, flight refueling of large bomber formations is an impracticable proposition. Therefore, to ensure mobility, forward bases are essential for every long-range bomber operation.

Missiles can be launched from any flat surface. The launching sites can be easily camouflaged and the servicing vehicles dispersed around the area until the time of launching. These sites can be conveniently shifted from one place to another, thus making it easy to redeploy the missile as the ground is gained. These factors give a high degree of mobility to the missiles.

Experiments on launching missiles from ships and submarines have been successfully carried out, thus further increasing the mobility of the missile.

Surprise

Surprise is an important factor for the success of the attack, but the early warning methods have improved so much that the bomber cannot achieve the degree of surprise necessary to catch the defending forces unaware. In this respect the missile has a special advantage. With its short duration of flight and its speed about five times that of sound, no radar could possibly pick it up in time for effective interception.

Although modern bombers have gained tremendously in range and speed, the defense has also advanced greatly by increased efficiency of radar and fighter interception systems. Heavy guns and rockets fitted in modern fighters, air-to-air missiles with proximity fuzes and vertically launched interceptors make a bomber's task extremely difficult. Under these circumstances, deep penetration by large bomber forces would inevitably involve risk of heavy losses if the raiders were not equipped for self-defense and if long-range fighter escort were not provided.

The problem of long-range fighter escort is also difficult. High fuel consumption of jet engines has reduced the fighter's range considerably, thus ruling out the prospect of achieving the required endurance in any aircraft substantially superior in performance to the modern bomber.

By virtue of very high performance, the missile does not require any form of protection. Nothing short of a fully automatic guided projectile could intercept a supersonic missile traveling at 3,000 to 4,000 miles an hour.

Evasion

To ensure uninterrupted operations, it is necessary for bombers to avoid engagements with enemy fighters and to stay clear of other enemy defenses. Experience of the last war shows that this could be achieved by diversionary raids, both real and synthetic, and by jamming the enemy's radar detection apparatus. However, the employment of bombers to mislead enemy defenses is a wasteful dispersion of the offensive weapon.

The guided missile, on the other hand, can go uninterrupted through enemy fighter defenses, although it cannot avoid electronic interference.

Conclusion

There is little doubt that, strategically as well as economically, the missile is the weapon of the future. It is superior to the bomber in speed, rate of climb, and ceiling, and can achieve tremendous surprise. By virtue of its high performance, it possesses an invulnerability far exceeding that of a manned bomber. The missile requires few strategic materials

as compared to the bomber and can be mass produced without having to set up complicated heavy industries. It is cheaper to produce and, being an expendable item, requires no maintenance. The cost of a bomber is 80 times that of a missile of the *V-2* class and unless a country has all the strategic materials for manufacturing a bomber, its production capacity is bound to be limited.

A bomber requires professional crews, trained at great expense, to man it. It requires a large technical and equipment organization and a number of skilled engineers to keep it in the air. Other requirements are hangars and airfields with long runways. These installations present the enemy targets which would require heavy defenses in case of a war. Various ground stations and auxiliary services such as Air Sea Rescue Service have to be set up for the safety of the manned bomber.

The components of a missile, on the other hand, are manufactured in small factories and workshops dispersed throughout the country. The missile requires a simple launching vehicle for takeoff, which can be moved and redeployed easily.

Finally, there can be no defense against guided missiles with the exception of radio countermeasures.

Soviet Political Theory and History

Digested by the MILITARY REVIEW from an article by "Wharry" in "The Journal of the Royal Artillery" (Great Britain) October 1954.

DO YOU recall the know-your-enemy, nationwide, advertising campaign during the war? Whoever you were, wherever you went, you were screamed at from the orderly room, the headquarters staircase, or the post exchange canteen—*Know Your Enemy*. The drill was not only to recognize him on the battlefield but to identify him in your midst. After the episode in Norway in April 1940 of a certain Major Vidkun Quisling we all became very fifth-column conscious; although, in fact, within our own circle there were few quislings.

Our problem today is much more serious. Already we have had 1 Briton and 20 Americans wishing to remain with the Chinese Communists in Korea; these from our Allied "peacetime" forces in one small theater of operations. What of global war? What of the civilian population? How many fanatical Communists are there in England today, ready to sabotage and spy?

There seems a case for studying our potential enemy and his methods. One of these studies must surely be his theories and intentions. We have no *Mein Kampf*, but we do have Karl Marx.

What is Communism?

Communism, or rather the ideal of communism, reaches back to the earliest records of Western political thought. In about 399 B. C., Plato gave us, in his *Republic*, a conception of Utopia; every man must "do his part" to the best of his ability, and the result would be a state in which everyone is not only happy and prosperous, but could live at peace with his neighbors. In this he was not original; all men, from time immemorial, have dreamed of a warless, classless, and stateless society.

Religion and philosophy have always taught brotherly love. Unfortunately, it seems, our economic system gives us a society of masters and servants: of con-

trollers and controlled. Notwithstanding this, Marx and Friedrich Engels dreamed up a philosophy whereby Utopia would be manifest. The greatest minds of all times have been similarly occupied. Some were solemn and serious, such as Plato: some were flippant, such as Dean Swift and Voltaire. Descartes thought he would find a solution in mathematics. Marx and Engels took economics for their research, and on their theories stands the Party Line today.

A surprising thing is that communism does not exist. In considering the potential enemy, we look toward the Union of Soviet *Socialist* Republics. There is no mention of Communist Republics. In terms of economics, society was to develop from feudalism, through capitalism and socialism, to communism. When Marx laid out his *Communist Manifesto* in 1848, Europe had already passed from the feudalistic to the capitalistic, and democratic socialistic movements were springing up all around. There was a need to differentiate between these movements and the one Marx had in mind; therefore, the term communism was used prematurely and the Soviet Union is passing through the socialistic stage at the present moment.

Russia and Communism

As far as Communist movements were concerned, Marx did not consider Russia a possible target for experiment, because feudalism was still going strong and there was absolutely no sign of capitalism developing. Except for this fact, Russia would have been an ideal guinea pig, as, since the "Decembrist" uprising in 1825, she had thought unceasingly of revolution. And revolution is one of the main supports in the structure of Communist theory and practice. Such revolution may be bloodless; our own Industrial Revolution was a useful example to Marx.

Marx always held the conviction that nothing could continually be altering without, at some stage, undergoing a complete transformation. As Carew Hunt puts it:

Change takes place by imperceptible quantitative mutations until there arrives a point, which Hegel calls the node, beyond which a thing cannot vary whilst remaining the same.

An everyday example of this is when water turns to steam: from 0 to 100 degrees centigrade, it has undergone continual change, if only of temperature, then suddenly it "revolts" and becomes steam. So, in ever-changing society revolutions are not only desirable but inevitable; anyway according to Marx.

Although Russia held no interest for Marx, the Russians themselves showed very definite interest in him. In 1870, a group of Russian revolutionaries asked him to represent them on the General Council of the First International. It was in 1883 that George Plekhanov started the "Liberation of Labor" group, with a Marxist program. Although the Russians adopted the Marxist theory and doctrine, they never adopted the idea that the Western World was to save Russia; rather they held the view that it was Russia's mission to regenerate the West.

Plekhanov always firmly believed that capitalism was necessary to Russia, in order to evolve a proletariate; it was this proletariate, and not the peasantry, which would eventually lead the revolution to socialism. The Populists, however, equally firmly believed that the country need not pass through the Capitalist stage, but could revolt directly from the feudal to the social. Marx shared their hopes, if only because of the time factor involved, but never committed himself to agreeing to their theory. Eventually, Plekhanov was to be proved correct, and, by 1914, capitalism had begun to make great strides in Russia and there were about 3 million, suitably organized and indoctrinated, workers in the factories.

In 1893, Lenin came on the scene and

started uniting the Marxist thinkers. After a short "visit" to Siberia, he went to Switzerland and started a clandestine party newspaper. It was this newspaper, *The Spark*, which made Lenin's brand of Marxism an effective force. Soon after, in 1898, the Russian Social Democratic Labor Party (RSDLP) was founded and continued to gain prestige until, in 1903 at the Second Congress in London, it split up into two factions, the Bolsheviks and Menshiviks. These parties, however, continued to work within the orbit of the over-all RSDLP until the 1912 Conference at Prague, when a complete rift caused their separation.

The best brains gradually drifted toward the Menshiviks, while the Bolsheviks, although remaining thoroughly well organized, fell rapidly into the position of a junior partner. The Menshiviks were orthodox Marxists and held fast to the correct pattern—capitalism must be introduced, the proletariate thus formed must be organized and then the proletariate-bourgeoise revolution put into effect—and held, therefore, that no proletarian revolution should be attempted until all the stages had been completed. The Social Revolutionaries—a third party sprung from the Populists—opposed this somewhat long drawn out program. They wanted close association with the peasants, resulting in an agrarian revolution and, unlike the Menshiviks, they advocated, and indeed practiced, terrorism.

Thus, by 1904, Russians were generally preparing, in one way or another, for revolution. Unless the various parties got together, there was every chance of results being abortive; this is exactly what they were. The Revolution of 1905, following the Russo-Japanese War, was a complete flop. It is, however, interesting to note that in his *Left Wing Communism*, written in 1920, Lenin declared that "without the dress rehearsal of 1905, the victory of the October Revolution would have been impossible." This is, possibly, only a case of being wise after the event and compensating one and all for their otherwise wasted effort.

The great Revolution of October 1917—again after defeat in war—really started in February of that year, with a series of demonstrations resulting in the abdication of the Czar. Soviets were immediately started in every town and village; those in the towns were controlled by the Menshiviks: those in the villages by the Social Revolutionaries. The Bolsheviks, led by Stalin and Molotov, were too weak to do anything but agree with the Menshiviks and bide their time; this they did very successfully. It was now that Lenin played his very important part. In some way or another, both the Menshiviks and the Social Revolutionaries had connected themselves with the Provisional Government, which had failed, in the eyes of the people, to meet, even remotely, the requirements of the initial uprisings. Lenin having first suggested that the Government should be replaced by a Congress of Soviets, with the cry "all power to the Soviets," now declared "the dictatorship of the proletariate and the poor peasantry." By these moves the Bolsheviks, continuing their policy of promising the people all they demanded, steadily gained strength. In September, General Kornilov attempted a counterrevolution, but was immediately quashed, mainly by the efforts of the Bolsheviks. On 23 October, the Armed Forces mutinied, the Government was thrown out, and the Bolsheviks seized power while the other two parties were still trying to sort out their differences. The fact that the Menshiviks had gone side by side with the Bolsheviks for so long and had, in fact, fomented the revolution, meant nothing to anyone, especially to the Bolsheviks. Now started the dictatorship of the proletariate, which has continued to this day.

It was very clearly pointed out to one

and all, that the Revolution was not intended to do away with the State, but to end the control of the State by the bourgeoise. Now there would be a dictatorship of the proletariate which would end the exploitation of man by man, and be of temporary nature only. The exploitation of the proletariate by the dictatorship never seems to have cropped up.

In 1922, Lenin suffered his first stroke and it fell to the Secretary of the Party, Sosso Djugashvili, or officially Joseph Stalin, to run the business of the Central Committee as directed by the leader. Lenin died on 20 January 1924, and during those 2 years Stalin had not been idle. No direct successor was appointed to Lenin; it was unthinkable that such a man could exist. Stalin was voted in as Secretary and by carefully reorganizing the party bureaucracy, he was soon to control the entire machine and, what is more important, anyone who wished to remain part of it. He won his great battle against Trotsky and, in 1928, ousted Zinoviev and Kamenev. All were replaced by men loyal to Stalin, one of whom was editor of *Pravda*, the party organ. Stalin was now in sole power and was to remain so until his death. The most startling creed produced by Stalin, in his 25 years of power, was, probably, that which laid down that communism, to be successful, need not be worldwide but could be confined to one country.

Theory of Communism

It is, of course, quite impossible to even start to cover the theory of communism in an article of this length. The subject itself has been covered by many brilliant men, Communist, anti-Communist, and neutral. I merely wish to try and point out the main features of Communist theory; as it were, to offer you an appetizer to the subject.

You cannot start to read any article or publication on the theory of communism without bumping up against dialectical materialism. Insofar as I understand it myself, I will try and explain it. The term dialectic comes from a Greek word meaning to discuss—or debate—a problem with the intention of arriving at the truth, by exposing the contradictions put forward by the disputants. For example, one side affirms a point which is immediately denied by the other. Then the disputants take out what appears to be true in both sides of the argument and are, thus, one stage nearer the truth. However, the truth thus formulated is itself suspect and open to further inspection; thus, the entire process starts again. It would certainly appear to be proof by exhaustion.

What of materialism? Western philosophy has always accepted a superior being, normally looked upon as God, as being answerable for certain inexplicable matters of nature. It is normally accepted that man does not control his ultimate destiny. It follows, therefore, that man cannot change himself and is subject to nature. To put it in a nutshell, the spiritual or ideal is prior to the material. This is idealism. Materialism is the exact opposite, as it holds that matter is prior to the spiritual, if, in fact, the spiritual exists at all. It follows that by studying his actions in the past, and the results thereof, man can change his nature and control his destiny. Man is complete master of himself.

Dialectical materialism is the basis of all Communist philosophical thought and argument. Stalin defined dialectical materialism as "the world outlook of the Marxist-Leninist Party." He further explained that "its approach to the phenomena of nature, its method of studying and apprehending them, is dialectical, while its interpretation of the phenomena of nature, its conception of these phenomena, its theory, is materialistic."

Add to this their dogma that there is

no such thing as formal logic and that nothing can remain the same, even for the space of a short discussion, and you have a basis for a philosophy which can always be twisted to suit the ultimate aim. Formal logic rests on the very obvious proposition that A equals A, or that a dog is a dog and not a wheelbarrow. Within reason, therefore, we accept a thing at its face value; anyway for as long as a discussion on that particular thing is to last. The Communists, however, represent everything as being in a state of becoming something else, even while you are trying to discuss any one thing. No sooner have you started to discuss the merits—or otherwise—of, say, a pound of sugar, it has, in fact, become more or less than a pound and, possibly, might no longer be sugar. What is much worse, it continues to go on changing. They look on formal logic as something very elementary; it could be compared to their own dialectic as a black and white snapshot to a colored 3-D film.

From dialectical materialism one has to go to historical materialism and then, perhaps, one can begin to comprehend some of the Marxist theories on such matters as economics, the class struggle, the state, and revolution.

The above statements on theory may have given you some idea of the difficulties to be faced in making even a brief study of the theory of communism. Of one thing I am certain, the rank and file cannot possibly, remotely, begin to understand the principles on which their very lives are based. A result is that the party continues to rule because, being the most highly developed part of the proletariate, it realizes what the other poor devils would realize if only they were not so backward; that is to say, the members of the party realize where their true interests lie. This is very convenient for some.

One of the main tactical moves made by world Communists is to join forces with any party which will help them to get representation in Parliament, and so get at the masses of the people. They would join hands with Socialists in order to oust the rightwing elements, but for only as long as it suited their purpose. The immediate enemy of communism is socialism. The Socialists are the people who are competing with them in their wooing of the proletariate; the rightwing elements can be dealt with at their leisure. When it suits them, of course, they will happily stab any Socialist in the back.

Another well-known move of the Communists is in the field of economics. They are always trying to get their members into controlling positions in the trade unions. Here is a very real danger. Communism appeals more to the skilled worker than to the laborer; the former has sufficient intelligence to prove that a little learning is a dangerous thing. He learns of Utopia and that is it.

The Communists are not always willing to carry out their tactical and propaganda moves in their own name. Everywhere today one sees, apparently, non-Communists behaving like fellow travelers. This is probably the shrewdest move they have made, and certainly one of which they are well aware. They form some kind of popular club, possibly a "Peace Club," with a locally well-known, and obviously well-meaning, non-Communist at its head. Behind the scenes, and possibly in quite large numbers, are Communist honorary secretaries and members. One can seldom convince the non-Communists that they are being used and that when it suits them, their "friends" will turn on them and deny, if necessary, all the slogans they have recently been shouting from the roof tops. "When I am the weaker, I ask you for liberty, because it is your principle; but when I am the stronger, I take it away from you because it is not my principle."

Although it has now been accepted that communism can work in a single country, it has also been ruled that, in order to achieve this, the country concerned must be free from Capitalist influence near its borders. When a Capitalist state on the borders of the Soviet Union has been successfully "treated," it becomes a satellite, and as such its own borders then require cleansing. Whatever the fundamental doctrine of the day, the Soviet steamroller will move on.

The Soviet policy is to break capitalism; this may well be done through colonial empires. Communists will always link capitalism and imperialism with the subjugation of the backward races for economic gain. If one can destroy the source of this financial benefit, by putting an end to the cheap exploited labor, or the raw materials concerned, then one has directed a blow at capitalism, and socialism is one stage nearer.

How long will the masses in the Soviet Union continue to be controlled by the party? It is impossible to say. The Party Line is such that the more powerful they become, the nearer they must be to the "node" and their eventual disappearance. If this line is accepted by the people, then, presumably, they are content to watch the party become all powerful; by which time they will be incapable of action even if the gaff is blown.

Infantry and Tanks

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel A. E. C. Bredin in "The Army Quarterly" (Great Britain) October 1954.

IT IS PROPOSED, in this article, to examine a number of actions in which the author took part, involving infantry and tanks; and from this examination attempt to draw certain conclusions, for what they are worth, on the subject of co-operation between the two arms.

Let it be quite clearly understood that the author's conception of his own arm, the Infantry, is that it is the *Arme Blanche;* that the real infantryman is, and must be, the fighting foot soldier, skilled in his weapons and minor tactics, able to operate under all conditions in any type of country, and never a mere "occupier of ground" or a "tank follower."

However, in these days of modern weapons of destruction and with so many conflicting calls being made on the nation's manpower, it is essential that the British Infantry, scanty in number, should be given a "fair fighting chance." To that end he should be adequately supported by other arms with a view to saving casualties and avoiding a war of attrition. We do, therefore, require a proportion of machines, at any rate, to redress the balance in our wars against aggressors possessing overwhelming numbers; but let us never lose sight of the fact, which so many "cranks" and so-called experts do, that what really counts in the end is the man, and his state of morale.

The entire question of infantry and tank co-operation, of course, is an absorbing subject and can be argued about from all angles; and, as so often, theory does not always make out in the hard world of practice when unpleasant things are happening all around one.

Let us now examine some of the operational experiences selected.

Assault Landing

On 10 July 1943, the 231st (Malta) Infantry Brigade, an independent brigade in XXX Corps, assaulted at the fishing village of Marzamemi on the eastern edge of

the Pachino Peninsula in Sicily. The immediate objective of XXX Corps was to secure the airfield at Pachino itself and then move inland to the north and northwest to protect the open flank of XIII Corps in their advance on Catania.

The brigade assaulted with the 1st Dorsets on the right and the 1st Hampshires on the left. The task of the 2d Devons, with a squadron of *Shermans* in support, was to break out of the narrow bridgehead thus secured and capture a coastal battery about 2 miles inland. The assault was completely successful against weak opposition, but the Italian gunners stuck to their job with greater courage than their infantry on the beaches. Actually, "B" Company of the 1st Dorsets, pushing on with great *élan*, nearly completed the capture of the enemy battery before the Devons arrived, but at that point some *R35* tanks decided to counterattack in the hope, presumably, of saving the battery. It was here that certain factors were brought home to the author:

1. Our own tanks were not, as we imagined, invulnerable and invincible. They were extremely cautious, due largely to their being on strange ground and temporarily "off balance"; and they were never ahead of the infantry.

2. Once our own tanks had recovered their balance, they were able to knock out, from hull-down positions, the moving enemy "tin cans" quite easily.

3. The only satisfactory method of cooperation with our tanks was personal contact.

Seizing a Hill

On D+2, 8 June 1944, the 8th Armored Brigade broke out of the 50th Division bridgehead southeast of Bayeux, with the object of seizing successive pivots up to and including Mount Pincon; the pivots were to be those from which the 7th Armored Division, landing behind 50th Division, could operate. As the motor battalion of 8th Armored Brigade, the XII Kings Royal Rifle Corps, had not at that stage landed, their place was taken temporarily by the 1st Dorsets of the 231st Infantry Brigade, which had been in the assault at Le Hamel-Asnelles. Needless to say, the "bogus" motor battalion had no motors in which to move although one company had acquired bicycles.

The 8th Armored Brigade Group broke out of the bridgehead on the afternoon of 8 June near Saint Leger and advanced through Loucelles and the Audrieus to seize point 103, just north of Tilly-sur-Seulles with its "attachment" of Saint Pierre. The 8th Durham Light Infantry, with the Sherwood Rangers were, at the same time, trying to seize and hold Saint Pierre. After disposing of the opposition in the Audrieus, the force established itself on point 103 by the evening of 9 June.

The battalion was disposed in the form of a somewhat widely spaced protective "box" around the armor and the Essex Yeomanry, the self-propelled field regiment. A squadron of tanks was placed in support of each company. That night the 8th Durham Light Infantry was heavily engaged at Saint Pierre and part of that battalion was forced to withdraw into the point 103 position. The remainder held on with great determination and constituted a valuable outpost to our main position.

From then on we were favored with ever-increasing attention by the enemy, and it was quite obvious that our penetration into his territory, menacing as it did his main lateral road between Caen and Caumont, was most unpopular. Between this time and 12 June, when the advance of the 7th Armored Division from Bayeux began to make itself felt, point 103—"Tiger Hill" as is became known—was under constant counterattack, mainly by the 12th SS Panzer Division which was equipped with *Mark VI Tiger* tanks. These counterattacks took the form of very heavy fire from the enemy's *Tigers* and artillery from the

south and southeast, accompanied as often as not by infantry advances through the close country between point 103 and Cristot to the east. Only the *Fireflies*—17-pounder *Shermans*—and the Essex Yeomanry could really compete with the enemy *Tigers*; the battalion was sorely tested, but it held firm and a somewhat critical situation was averted.

In this battle, the author's chief impressions were as follows:

1. The importance of close co-operation between infantry and tanks is as great in defense as in attack. There is no doubt that the moral effect of tanks sticking it out in the defense alongside the infantry—particularly if the enemy is attacking with tanks—is very great. By the same token, it was not encouraging when our tanks, because they were out-gunned, withdrew behind the crest, leaving the infantry to continue to "take it" alone.

2. Amid the distractions of a counter-attack, there was no effective substitute for personal contact between the infantry and tank commanders.

3. The bursting of many of the enemy's 88-mm shells in the treetops was one of the unpleasant hazards of the bocage; and it effectively caused the closing of tank turrets, making it all the harder for the foot soldier outside the tank to speak personally to the commander inside.

Battle of Hottot

On 19 June, the 231st Infantry Brigade made an attack on Hottot with the object of seizing that important village; the latter was not only on the enemy's main Caen—Caumont lateral but it also dominated a considerable portion of the Seulles valley to the south of Juvigny. The task of the 1st Dorsets on this occasion was to protect the right flank of the main attack with the Château de Cordillon—immediately east-northeast of the village of Hottot—as the final objective. Armored support was given only to the main attack. The entire attack met with stiff resistance, and it was quite obvious that the enemy was not prepared to give ground at all if he could avoid it. The leading companies of the author's battalion advanced with great doggedness in difficult bocage country and gained ground right up to the Château de Cordillon. However, we, the flank-guard, became heavily involved not only in securing the area of the Château de Cordillon but in protecting our own right flank; and the enemy fought back, making skillful use of tanks, dug-in and mobile, in support of his infantry. As most of the possible approaches were mined, and a further obstacle was created by the existence of a marshy stream—enlarged by the rain—the forward move of our anti-tank guns was difficult and was delayed. Bitter fighting ensued and many brave deeds were performed; but there could be no question by the end of the day of doing more than holding on to what ground we had won—which was quite considerable—and reorganizing.

During the action the author's reactions were:

1. If the infantry is unsupported by tanks against an enemy who has tanks, the antitank gun or weapon assumes first importance. In those days, with the urge toward enlarging the Normandy bridgehead and to keep on hammering the enemy, detailed reconnaissance of close bocage country could not be carried out; in fact, the battalion only arrived in the assembly area from another locality just before the attack, and there was not much information available. As a result, the obstacles to the move forward of antitank guns had to be discovered the "hard way."

2. The use made by the Germans, in their then defensive system in Normandy, of dug-in tanks supporting their infantry well forward. This may have been partly due to the fact that nearly all the German armor in the west at that time was concentrated against the British.

3. After all our losses since D-day, a large proportion of the battalion went into a particularly unpleasant action for the first time. In some of their young lives the moral effect of the enemy being in possession of tanks, whereas we were not, was undoubtedly quite considerable.

4. The value of the Infantry Antitank Projector—or equivalent—in the hands of stouthearted men, especially in the absence of antitank guns and our own tanks.

In the second attack on Hottot, the battalion was again on the right. Our special task was to ward off the main enemy threat which was likely to materialize in the form of counterattacks from behind or to the south of the Château de Cordillon. The attack was actually designed to bypass the Château and its enclosed grounds; and it was suspected, not without reason as we discovered later, that the enemy's most dangerous reaction to our advance was likely to be an infantry and tank counterattack against our right flank as it moved south past the Château area.

After a day's hard fighting, the brigade advanced into the northern outskirts of Hottot, but casualties had been heavy and the expected enemy counterattack did, in fact, materialize. This was the first occasion that the author can remember of cutting "tank tracks" up to just behind the frontline before the attack, and the engineers continuing these tracks as the advance progressed. Advances in the bocage were normally made from hedge to hedge with the tanks and some of the infantry weapons "shooting in" the riflemen as they advanced to capture the enemy positions in the next thicket and substantial hedgerow. In their move forward to take post with the leading troops, the tanks, other armored vehicles, and the antitank guns made use of the tank tracks.

The chief impressions of this battle from the infantry and armor aspect were:

1. Again the important moral effect of tanks working with the infantry and, at any rate until the arrival of the antitank guns, staying with the companies during the reorganization on the objective, and the importance of tanks in the latter role in helping to deal with enemy infantry counterattacks supported by armor.

2. The fact that in close country as typified by the Normandy bocage, it is quite erroneous to imagine that the tanks have to wait for the infantry; rather it is the other way about, for when our tanks were so blind in the face of lurking dangers—anything from 88-mms to bazookas —they relied heavily on the infantry to deal with these "unpleasantries."

3. Again the value of the Infantry Antitank Projector—or equivalent weapon—in such country, when used with determination at close range.

4. The vulnerability of most of the special armored vehicles, especially the *Crocodiles*, with their "soft bottoms." In fact, the latter were often of no great assistance and somewhat of a liability.

Breakout Battles

Five days after the American offensive of 25 July, the VIII and XXX Corps began their share of the breakout battles; 50th Division, to which the author's battalion belonged, was directed on the much battered communications center of Villers-Bocage; and the 43d Division on their right was to capture Mount Pincon. There was much hard fighting before the breakout had been achieved and the advance to the Seine begun. So far as we were concerned, it consisted of two phases. The first phase, 30 July to 3 August, was the advance from Le Lion Vert-La Croix des Landes, on the lateral road from Caen to Caumont, south through Orbois and Lictot to Le Mesnil and La Douetie on the high ground overlooking Villers-Bocage from the northwest. The second, 11-13 August, was when 50th Division took up the running from 43d Division immediately south of Mount Pincon and advanced through Le

Plessis Grimault and Cauville to beyond Saint Pierre-la-Vieille and Les Forges, well on the road to the crossings over the Noireau at Condesur-Noireau.

Practically the entire country over which we fought was bocage. The attacking battalions were normally supported by a squadron of *Shermans*. This meant that when there were two forward companies, each was normally supported by a troop—on occasions a particular forward company might have two troops. In addition, there was, of course, often a proportion of special armored vehicles allotted. A good deal of planning on aerial photographs took place beforehand, from battalion-squadron level to company-troop level; and in the actual advance, the company commander and troop leader's tank were never very far from each other. The hedge to hedge advances afforded opportunities for co-ordinating and planning the next step. Co-operation was particularly close in this tricky country; the infantry welcomed the tanks' ability to pour fire—75-mm and *Besa*—into, or sufficiently close to, the troublesome Spandau posts, and the tanks were protected by the riflemen against any close-range antitank weapons.

The chief impressions retained by the author after these breakout battles were:

1. In close country, like the Normandy bocage, the need for careful planning at all levels on aerial photographs or good maps, especially in the absence of good observation. Similarly, the need for close and continuous liaison between the infantry and tank commanders; especially when in close country, full of natural and artificial obstacles, advances are inevitably slowed and it is so often, perforce, a case of "one step at a time."

2. The interdependence of the infantryman and the tank; and how the two parts can become one irresistible team. However, the close country can be said, with truth, to be "infantry country"; and in it the tank can fairly be said to be more dependent on the infantryman than vice versa.

Operation *Market-Garden*

On 4 October 1944, the 1st Dorsets, with two companies of the 1st Hampshires, attacked north from Bemmel—itself an important bastion in the Nijmegen bridgehead north of the Waal. The object of this attack was to secure the right flank of the Nijmegen bridgehead where the enemy was dangerously close to the vital bridge itself—as a result of their strong counterattacks following the withdrawal of the remnants of the 1st Airborne Division from Arnhem. In fact, the enemy seemed to have taken a new lease on life and was in an aggressive mood. East of the main road Nijmegen—Arnhem, the line ran through Elst, Bemmel, and just west of Haalderen down to the Waal River. While the 151st Infantry Brigade cleared the enemy out of Haalderen on our right, we were required to push him well away from Bemmel and back to the line of the Wetering Canal. The battalion's objectives were the hamlet of Heuval with some surrounding orchards and farm buildings. This area had recently been overrun by an enemy counterattack which had nearly reached Bemmel itself.

The battalion attack met with determined opposition by troops of the 19th and 21st SS Panzer Grenadier Regiments of the 10th SS Panzer Division, who were plentifully supplied with bazookas in addition to their normal infantry weapons. They also had the benefit of very heavy artillery support from both the north and south banks of the Neder Nijn—the German outposts on the north bank had, of course, excellent observation over the flat "island." This typical low-lying area of Holland was intersected by water cuts and drains; wheeled and even tracked vehicles as often as not were forced to keep to the roads. Many of the roads

were raised above the level of the surrounding country, making easy targets of the vehicles using them.

In its attack, the battalion was supported by a squadron of *Shermans* of the 1st Coldstream Guards. We also had a troop of *M 10s* in support. One of the features of this attack was that, owing to all vehicles having to be roadbound in places, the infantry and tanks were not always advancing on the same axis. In the planning beforehand, it was recognized that this would be the case, but it needed very careful co-ordination when the actual attack began. The tank liaison officer proved useful here and once again the importance of personal liaison between infantry company commanders and tank troop commanders at agreed points was established. In one case, a troop of tanks from the left flank successfully "shot in" a company on to its objective. This move, the final and decisive attack of the day, was co-ordinated by the commanding officer being with the company, launching it, and directing the fire of the tanks on to the "target area." The main impressions carried away from this battle were:

1. Once again the vulnerability of tanks in country of quite another type to the Normandy bocage.

2. The special problems inherent in an attack where the infantry and tanks have, of necessity, to attack on different axes; and special measures are needed.

3. The value to the infantry commanding officer of a tank liaison officer; if the latter happens to be as senior as the second-in-command of the tank regiment, so much the better.

Rhine Crossing Advance

Opposition after the Rhine crossing was patchy. From the viewpoint of the infantry, the main interest lay in some of the night advances and attacks before the armor broke out of the Rhine bridgehead, and also in some of the canal crossing operations. A new element in infantry and tank co-operation had by now come to the fore—the use of the "Kangaroo" or Armored Personnel Carrier (APC). The author believes he is correct in saying that the "Kangaroo" was first used by the Canadians at Falaise in August 1944; and it proved to be of particular value in these final stages of the war. There is no doubt that many lives among our infantry were saved, particularly in that "dangerous space" between the assembly area and the objective; and a great deal of fatigue was also avoided by transporting the foot soldiers to the objective or as near as possible to it from behind the assembly area. So far as the 43d Division was concerned, each battalion acting as advance guard in the advance to Bremen was mounted in "Kangaroos"; sometimes there were only enough APCs for two companies, but this was usually sufficient under the conditions then prevailing. On 12 April, between the Dortmund-Ems Canal and Bremen, the battalion made a "Kangaroo" attack—two companies—supported by the Sherwood Rangers. The armored vanguard of the latter was held up by antitank fire from the village of Lastrup; by that time the main guard had reached the forward edge of a wooded area and faced over 1,500 yards of flat, open country to Lastrup. It was, therefore, decided to "gallop the position," and a fine spectacle ensued. Two companies of the battalion, deployed in "Kangaroos" and supported by the tanks, drove across the open fields on to the enemy entrenched on the forward edge of the village; there the infantry dismounted and set about the mopping up. Our guns supported the attack by concentrations and smoke on the forward edge of Lastrup, while the tanks and the "Kangaroos" also fired all available weapons; this all made an imposing display of firepower, much of which was mobile.

Almost at the very end of the war in Europe, the battalion encountered fanatical opposition at Tarmstedt, on the road to Bremerhaven. The battalion—with two companies in "Kangaroos"—was again in the van, with a squadron of the Sherwood Rangers. Once more we were operating in open, low-lying, boggy country in which vehicles, including tanks, were forced to remain roadbound. There was an unpleasant looking open stretch between Wilstedt, which we had reached without undue exertion, and Tarmstedt itself. Halfway to the latter, on the lowest ground, there was a small wooded "enclosed area" astride the road which at that point crossed a stream. The moment the vanguard emerged from Wilstedt, the enemy opened heavy artillery and *Nebelwerfer* fire which inflicted some damage. A dismounted company was sent to seize the wooded culvert area halfway to Tarmstedt, and then the leading company in "Kangaroos" with some tanks dashed straight through to Tarmstedt and attacked the defenders. The second "Kangaroo" company column was cut in half by the blowing up of one of the vehicles —nothing was left of it—by a new type of mine appearing about this time. These mines were found to be actuated by vibration and only blew up after an unpredictable number of vehicles had passed over them. The craters which were caused immediately filled with water and were so big that they had to be bridged; in the boggy country diversion by vehicles was not possible. We were to encounter many more of these craters on the road to Bremerhaven before the "cease fire."

Clearing Tarmstedt took until the early hours of the next morning, and *Wasps* (*flame throwers*) had to be used to drive some of the enemy out into the open; and there was even a small but fierce counterattack by SS fanatics who still believed in the Führer.

The chief impressions from the infantry and tank co-operation angle when considering these "Kangaroo" advances were:

1. The general suitability of APCs for carrying infantry co-operating with tanks.
2. The essential need for infantry in "Kangaroos"—perhaps even more than when on their feet—to be supported by tanks. When in APCs, infantry are less able to use their own weapons.
3. The importance of really good radio communications in "Kangaroo infantry" and tank co-operation, and the necessity for a really high standard of radio training.

Conclusion

In concluding these notes, it is proposed to recapitulate and record the main lessons to be drawn from the experiences described. The author is under no illusion that his conclusions are "great discoveries" or that they have not been considered and set down before. Their chief merit is that they were the result of practical experience. The main conclusions seem to be:

1. Tanks are vulnerable and on many occasions, and in many places, have to proceed with great caution. As a result, especially in "infantry country," tanks need the foot soldiers to protect them—almost more than the other way around—against any determined enemy well armed with antitank weapons. It is quite erroneous, under these conditions, to suppose that the infantry, even on its feet, cannot keep up with the tanks; and in many cases it may be the reverse.

2. The only really satisfactory method of infantry and tank co-operation is by personal contact. Proper planning beforehand from the map, aerial photographs, and points of vantage, where they exist, can do much to ensure good "stage management"; once the line of departure is crossed or when the enemy is doing the attacking, continuous liaison between infantry and tank commanders at all levels

is essential. A tank liaison officer, with the infantry battalion commander, is of very great value. When not in close contact, when the tanks are crossing "wide open spaces" at speed, or when the infantry is in APCs, intercommunication by radio assumes greater importance.

It must be emphasized, particularly at the infantry company commander, tank squadron, or troop leader level, that the noise of battle—and this, of course, includes our own tanks' weapons—the "fog of war," and death and destruction all around play havoc with theory. Radio sets get knocked out, or break down; the tank commander is too busy "on the air" talking to other tank commanders; and the tanks themselves rage around spitting fire and smoke to the very great danger, sometimes, even of the infantry they are supporting. All this lends additional point to careful planning beforehand at all levels and to the advance by bounds; at each bound the commanders can get together again and plan the next step. This methodical, step-by-step advance is, of course, all the more important when the infantry is on its feet and not able to go straight through to the objective in APCs.

3. The morale-raising value of tanks co-operating with infantry—especially if the latter has had heavy casualties, is tired, or is "green" and, therefore, likely to be unsteady—cannot be overestimated. On the other hand, if tanks under pressure of enemy attack withdraw prematurely for one reason or another, the morale of infantry fighting a defensive battle or resisting counterattacks after gaining an objective at heavy cost may well be impaired.

4. The antitank weapon is always of the greatest importance to the infantry when the enemy has tanks. It is of the first importance when, under those conditions, our infantry is unsupported by tanks.

5. Flexibility in planning and execution is necessary when one considers the varying conditions of terrain, maneuver, and the opposing forces. At one end of the scale was the deliberate attack in close country like the Normandy bocage against a determined enemy well supported by armor; and at the other the pursuit and destruction of enemy rearguards by infantry in APCs supported by tanks. Other problems are raised when infantry and tanks, for one reason or another, have to attack on different axes.

6. The general interdependence of infantry and tanks, when used together as one team, is axiomatic.

7. Infantry in APCs needs tank support almost more than infantry on its feet; the latter is better able to fend for itself. Because the entire force under these conditions is mechanized, the need for really good radio communications, and proper training in them, is of the first importance.

The author admits, in closing, that he has not said much about artillery support. This is only because he has tried to concentrate on infantry and tanks. It goes without saying that there is always need for artillery support; and the author is one who subscribes to the tribute: "the guns, thank Gawd, the guns."

AUTHORS

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Influence of Surprise

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WHEN the Germans, in the period 1939-41, crushed their adversaries in a lightning-like manner, one after the other, the staffs, amazed and surprised at this phenomenon, attributed these successes to the perfection of the German war machine and cleverness of its command. Nor was this conclusion without its justification for, indeed, the German war machine, at that time, was highly perfected and the German command had evolved proper doctrines of employment for its mechanized armed forces. This was, so to say, the material side of the problem. Less, however, was said or written of the influence of surprise, to which, one after the other, commands and armies succumbed, crushed, in the various campaigns. It could even be said that knowledge of this and failure to deduce, promptly, certain lessons with respect to it made these successes easier for the Germans.

This article is an attempt to show the influence of surprise in this phase of the war as well as an attempt to weigh our campaign of 1939 from this point of view. A general consideration of the first phase of the war permits the drawing of certain conclusions as well as, perhaps, casting a bit more light on our campaign which we are inclined to judge rather as a detached entity and not in connection with the background of the military occurrences of the first phase of the last war.

To begin with, let us recall those factors which, as a result of the experiences of World War I, indicated lines of development of armed forces and military doctrine. They are:

1. The utilization of the motor, armor, planes, and weapons of great firepower was leading to the technicalization and mechanization of armed forces and to a policy of the replacement, wherever possible, of man and horse by the machine. In consequence, theoreticians of the type of B. H. Liddell Hart, J. F. C. Fuller, or Douhet pointed to the possibility of a change in the doctrine of the conduct of war, or of operations conducted with the help of weapons directed by men—weapons of great firepower and speed of movement. This change would make possible the revival of maneuver which had expired in World War I.

2. The mass production of weapons brought into prominence the importance of their quality, which, in turn, led to the race for ever better and more effective weapons, and this had, and continues to have, a profound influence on the character of military preparations in time of peace, finding expression, as it does, in a rapid outmoding of the weapons produced. This has changed the concept of peacetime military preparedness.

In addition to this, the military capabilities of the different governments were determined by the productional capacities of machines, this production being on a scale hitherto unknown, a scale really exceeding the possibilities of a great many governments if obliged to conduct war independently.

Indications

World War II confirmed in their entirety these indications. Nevertheless, if we go back to the period between the wars, then with a certain degree of generalization, we shall be able to confirm the fact that not all of these indications were understood, and that they were acted upon to varying degrees by the leaders of the various governments.

Just before the outbreak of the war, we saw, on the one hand, the Germans in

possession of an armed force which, structurally, was organized and built in accordance with the concepts discussed above, an armed force supported by a powerful aviation conceived for co-operation with ground forces. Still more significant was the fact that this armed force was, to a large extent, motorized, armored, and organized in units trained and fitted for the exploitation of those advantages which it was able to ensure by rapid operation. The doctrine was there and also a corresponding instrument for putting it into practice.

On the other hand, France, who placed her principal reliance in ground forces, possessed a relatively large Army which was partly motorized and had numerous armored forces, but a very weak Air Force and no clear conception of how to use it. The postulate of the technicalization of her forces was understood and to a certain extent had been put into effect, but there was a lack of understanding of what this meant in the field of operational doctrine. Almost to the final hour, the French command looked upon the Maginot Line as invincible, as an assurance to them of time for all necessary changes of organization or concept. In the field of aviation, there was much need of an understanding of its altered role as contrasted with that of World War I. From the standpoint of doctrine, the French Armed Forces were ready to conduct war in accordance with the pattern of the final phase of World War I.

Great Britain, the native land of Fuller and Liddell Hart, has been caught unprepared, in regard to her Army, at the outbreak of the war, although technicalization and mechanization had been considered—which is understandable when one considers the great industrial development of Great Britain. Yet, the attitude of her leadership toward the concept of rapid operations was, for a very long period, a negative one. This is best illustrated by the fact that the experimental, large armored unit, organized in 1927, was dissolved the following year, since, according to an official declaration, "cavalry is indispensable and tanks have ceased to constitute a threat." In 1937-38, Liddell Hart, who was advisor to Hore-Belisha, Minister of War, convinced the latter of the need for the creation of an armored division, yet the two were unable to overcome the opposition of those of the military authorities who were against the idea. After this time, as we know from other sources, budgetary considerations played a role in this matter.

Aviation, however, conceived, above all, as an element of protection against attack from the air, was accorded enthusiastic recognition in Great Britain.

In the East, the Soviet Union, preparing herself for a try at world domination, had need, in line with her strategic doctrine, of a powerful war machine. She followed attentively the lessons drawn from World War I and her leaders early understood the necessity of the technicalization of the Soviet Armed Forces. It is certain that the Germans introduced much of this during the years of military co-operation. Accordingly, in 1939, the Soviet Union possessed the largest and most powerfully armed ground force as well as probably the largest air and armored forces. This Army was not, however, organized as an instrument of "rapid operations" although, as we know, it was prepared for mobile operations of the type of those of World War I.

The Lineup

Summarizing our observations relative to the future adversaries of World War II, we see, on the one hand, the Germans—strictly speaking, Hitler, and, back of him, Guderian—who understood what a mobile army was capable of in the field of operations, an army that was armored and possessed great firepower. The Germans, therefore, possessed in almost com-

plete readiness an instrument capable of the realization of the doctrine of blitz warfare. On the other hand, we see France and Great Britain possessing, jointly, forces of great numerical strength, partly motorized and equipped with tanks, almost in the same numbers as the German Army, but with a doctrine extremely different, taking no account of the possibilities that motor and armor were able to give.

Finally, we see the Soviet Union, possessing an armed force of great numerical strength, motorized to a certain extent, very well armed, with an armored and an air force of the greatest numerical strength in the world which, however, were, to a certain extent, outmoded. This armed force was not prepared for "rapid operations" either from the standpoint of doctrine or organization, although it was prepared for war of a mobile character.

We see, therefore, that in the West and in the Soviet Union, although to a greater or lesser extent the armed forces were technicalized, this revolution, which the motor had introduced into the calculations of operations with respect to time and space, was not understood. In the strategic echelon, the significance of the time factor in the field of military preparations, or the necessity of the maintenance of a considerably greater state of readiness on the part of the machinery of production, was either not understood at all, or else underestimated. In the domain of foreign politics, for a relatively long period of time they did not understand Hitler's diplomatic game—cold war—considering it, rather, as a collection of trumps than a game whose aim was either the complete subjugation of Europe or the camouflaging of war preparations which were being made under the very eyes of Europe with the intention of catching his unprepared adversaries by surprise.

In the years 1939-41, we were witnesses of this surprise attack by the Germans on their adversaries not only in the strategic and operational, but also in the tactical echelon on the field of battle: in the strategic field—since, thanks to his political game, Hitler attacked adversaries who were unprepared for war either from the standpoint of matériel or doctrine—gaining about 3 years' time; operationally and tactically, because of the fact that operational calculations were based on a faulty estimate of the German possibilities both with regard to the efficiency of their war machine and the factors of time and space.

The war assumed the blitzkrieg character in whose success the factor of surprise was prominent above all others. Because of this, during the period 1939-41, Hitler's adversaries lost control over the situation and forces all the way from the governmental level to the tactical echelon. On the field of battle, as we saw in Poland and in France—and it was in all likelihood the same in the Soviet Union—very quickly after the initial clash, chaos reigned and, frequently, panic, also. The background in which the commanders had been schooled betrayed them; the attempted contest between foot soldier and horse, and the machine quickly ended in physical exhaustion. With communications disrupted by the German aviation or the presence of German forces in the rear areas, there was no possibility of gaining an upper hand over the chaos. The reactions of the commanders and troops inculcated in long years of training failed—both the former and the latter often finding themselves at the limit of their endurance due to the surprise action going on about them; and the fact that the problem was beyond any solution by them, caused them to go to pieces. The difficulty was more intensified by the terror resulting from fire both from the ground and the air.

Such, more or less, was the course of

the operations in the Polish and French campaigns and, from what we can learn, to a greater or lesser degree also in the Soviet campaign. If we should go still further in our analysis, we should probably be convinced that it was not so much the physical manifestations as the physical results of surprise on the part of command and forces that were the most demoralizing and disabling factors. We cannot but perceive a parallel between the effects of surprise in the first period of World War II, and those of the surprises frequently resulting from Napoleon's operations and tactics in the first 10 years of his leadership. In both cases, old doctrines met with a new one following Napoleon's basic concept of *activitée, activitée, vitesse* (action, action, speed).

It is a strange phenomenon that, in spite of the experiences of succeeding campaigns following one another at relatively long intervals, attention was not accorded this factor. After the Polish campaign, there was talk of the great German numerical superiority, of the technical retardation of the Polish Army, of the weakness of its aviation, and the ineptness of its higher command. After the French campaign, there was talk of the dislike for war in the officers' corps and among other troops; and after the Soviet campaign, of the inferiority of the Soviet command and forces.

National leaders were accused of neglect in the domain of motorization and armament, of having inept commanders, and, frequently, of cowardice and susceptibility to panic. However, the principal reason was the element of surprise which affected the higher commands, and the leaders and combatants on the battlefield. This was produced by the use of something new, unforeseeable, and difficult to overcome unless one has a corresponding war machine from the standpoint of matériel, organization, understanding of doctrine, and training.

Analyzing further the surprise which occurred in the first period of World War II, it may be asserted that it was not the tank, the plane, or the motorization of the units that caused the surprise, for this equipment had been in use, was universally known, and in the possession of all. This surprise was the effect of their mass employment in mutual cooperation with one another. It is characteristic, however, that the concept of the armored division which, organizationally and in point of operation best expressed that which one could call the doctrine of blitz warfare, had been known a sufficient length of time. It had been studied in France, in Great Britain, and in Poland. However, everywhere staffs had arrived at the conviction that it did not introduce anything sufficiently revolutionary to produce the results we observed on the fields of battle in Poland, France, and the Soviet Union in 1941. Moreover, in Germany herself, up to the final months before the war, there existed opposition in the highest echelon of the Army to attaching any great possibilities of maneuver to armored forces. The memoirs of Guderian, the creator of the armored arm, expressly mention this.

It was no accident that the German successes came to an end at Moscow. The Soviet expanse had wasted the German war machine and had equalized the shaken equilibrium in the calculations of time and space. The Soviets had gained time and had slowly come to understand the cause of the German successes—and the surprise had ceased to work. Before the Soviets could seize the initiative, however, 2 or 3 additional years were necessary for them to overcome their laxity in preparing themselves for war. This was the result of the disregard of the lessons of World War I in the face of an enemy who, on the contrary, had regarded them, appropriated them, and, precisely for this reason, had surprised his adver-

saries in all the echelons of military activity.

At this point, the question may suggest itself of whether surprise on such a scale was avoidable. What was the reason for such capital error on the part of the many political and military leaders of Europe with great traditions and experience?

That error was committed is undeniable. Theoretically speaking, it may be asserted that is was avoidable. Taking into account, however, a number of factors which exercise an influence in normal state or national life, it was more difficult to avoid than it appears. It is not possible to deny that conservatism of military thought, "wishful thinking," faith in the efficacy of the doctrines of the victors of the preceding conflict constituted serious elements favorable to the committing of errors—that is, underestimation of the consequences of the mechanization of armed forces.

Machine warfare—especially in the event of a threat of war—demands complete preparation in the political, military, and economic domains. If one does not wish to be surprised, one must turn his military potential into preparedness for war far earlier than its outbreak. Present-day war does not give time for the elaboration of plans or the stocking of mobilization depots. From behind the smoke of the "cold war," "hot war" may burst forth at any moment. The rapid technical development of weapons leads to a constant armament race and, thus, to the adaptation of new means in tactics, operations, and even strategy. Today, this is universally known and, on that account, we are witnesses to an armed peace. Associated with this, and on an almost global scale, we also see in many states an armament race and attempts at the harmonization of the economy of peace with that of war.

Machine warfare, even in its initial form in 1939-41, already required such preparation. Thus, Hitler prepared for it, transforming the economy of Germany to a war economy. Europe's sole reply was its immediate transformation for war —at least in the domain of industry. It was necessary to throw to the winds concern for the balancing of budgets, for the stabilization of currency, and fears regarding political and diplomatic repercussions. Today, we may assert that in the Europe of the period between the wars, this was impracticable since the Europe of that time, especially with its lack of belief in war in the political echelon, was still far from the consciousness of what, at present, is certain knowledge.

The first period of World War II was an example of what an opportunity surprise, by means of new forms of combat or new weapons, gives an aggressor. Today, the principle of preventing an attack by an aggressor by first attacking him is stronger than ever. This "today" had already begun before 1939—but it was not realized at that time.

The vision of blitz warfare or of air warfare had been announced by the theoreticians, but, as has already been stated, its practical realization required a changeover to war economy from both the financial and the productional standpoints. In addition to this, the vision of machine warfare at that time was, as yet, only a vision and, therefore, something lacking practical confirmation. In theoretical deliberations there had likewise been a considerable number of points against the possibility of its immediate realization. It is a known fact that the governments and political leaders of almost all the interested states, as well as their respective general staffs, went in for cautious programs of a partial reshaping of their armed forces that would not be ruinous to their national economy. This was the second cause of the error committed, although, from the point of view of the conditions existing at that time, an error

that was, to a certain degree, justifiable.

Therefore, although the doctrine of machine warfare lay almost under their very eyes, only a person of Hitler's type—an adventurer who was playing everything on one card, and this the card of war and conquest—was able to take it up and put it into action under the conditions then existing.

Polish Campaign

After this consideration of the influence of surprise on the course of the first phase of the last war, let us turn our attention to this same problem in a special case, namely, to the Polish-German campaign in 1939.

Considering our campaign critically, we cannot, without committing an injustice, judge its results independently of the political events and military preparations of the Europe of that time. The military thought of the West, in view of the latter's importance and material possibilities, had its influence, of necessity, on our doctrine of operations. Likewise, the general attitude of Paris and London had their influence, to a greater or lesser degree, on our disbelief in war and our belief in the possibility of staving it off for a few years.

If we study the events of the years preceding 1939, we easily perceive the fact that with only minor deviations, we were basically traveling the same road as the West and, alas, in the first phase of the war, we achieved the same results.

We suffered surprise in the strategic echelon for the reason that we were not prepared for war at that time, counting on its eventual occurrence at a later date. We had set about the task of the technicalization of our Army too late, for we had barely made a start in the years 1936-37 and, what was more, the completion of the first phase of this program of modernization was not to be accomplished until somewhere around 1942. Germany in 1936-37, already had three armored divisions ready. Surprise in this echelon was undoubtedly increased by lack of proper vision of the nature of the approaching conflict since, incorrectly oriented themselves, the military could only misinform the supreme political authorities with regard to our possibilities in case of war.

Together with the West, we underestimated the influence of mechanization on doctrine. Together with it, we planned our defensive operations in an outmoded fashion, basing our calculations with regard to time and space on the horse of World War I and our war with Russia in 1920. However, the concept of the maintenance of the fighting for a few weeks until the time of the effective participation of our Western Allies was doomed to disappointment as a result of the great surprise in the very first days of the war. This was especially true during the first weeks of the fighting, when the resistance of our lines of defense, under the pounding of the armored battering rams, was reduced to zero, and the tempo of the enemy's advance, increasing manyfold, canceled almost completely all the planned resistance.

We underestimated the possibilities of aviation. Peacetime studies were often costly under our circumstances and appeared to point to the possibility of thwarting efforts toward the destruction of our railway and signal communication networks by the enemy. Also, simultaneousness and intensity of attacks to the degree which occurred in September 1939 were not anticipated. As a result, on the third day of the war, our communications system was chaotic and the proper direction of operations and major troop movements were impossible. On the field of battle, likewise, we saw abundant phenomena of tactical surprise in the frequent breakdown of commanders and the collapse of morale of the units, and, often, panic phenomena.

We went through what all of Hitler's adversaries, defeated one after the other, went through up to the winter of 1941. We went through it in a more severe form since, in addition to the weakness of our war machine, we had to face a great numerical superiority on the part of the enemy. I admit that of this superiority the military factors played the greatest role; however, a study of the matter by categories and in the light of calculations based on the final operations of World War I and of 1920, appears to give a considerably longer period than that which actually occurred. Therefore, the course actually followed in our campaign points to surprise caused, above all, by our lack of military vision.

A greater degree of technicalization in the case of our Army would certainly have given relief to our combatants and have mitigated their feeling of helplessness on the field of battle. However, it is improbable that the production of matériel on the scale permitted by our capabilities, although begun sufficiently in advance, would have had any profound influence on the outcome of the campaign. The fact must be taken into account that this production of matériel could not have been extended over a very long period of years, since it would have become obsolete, and obsolete matériel in machine warfare is useless. That a somewhat greater degree of technicalization would not have had any great influence is confirmed by the campaign of 1940 in which the French possessed, numerically, almost as many armored forces as the Germans, besides possessing a considerable number of mechanized units. This is confirmed by the Soviet campaign in which numerical superiority on the ground and even in the air was on the Soviet side. The reason for the German success resided, however, principally in the surprises permitted by their new doctrine of operations.

As for the technical retardation of our own Army, it seems to me that we were not in such poor condition in regard to this point as in regard to our lack of proper military vision. If we had had this, then certainly, estimating the course of our campaign in the most pessimistic manner, we would have found a suitable solution somewhere within the limits of our possibilities. Perhaps we could have defended some redoubt supported by inhabited places or forests; perhaps we would have contented ourselves with lines of resistance or with zones at considerably greater intervals, not deluding ourselves with the idea of the possibility of occupying them successively by withdrawing units; and, perhaps, we could have based all of our defense on a few redoubts in western Little Poland.

Cause of Failure

In our case, as in the case of the West, behind the loss of our campaign lay our failure to deduce the doctrinal conclusions from the mechanization of war machines, and our failure to take into account the almost revolutionary change required in calculations relative to time and space.

What was the reason, in Poland's case, that such all-around surprise could be effected? We can hardly suggest conservatism nor rigidity of routine in such a growing organization as was the Polish Armed Forces. On the other hand, lack of experience, especially in the higher command which was too largely animated by "wishful thinking" deriving from the experiences of the victorious war of 1920, which repeatedly had been overestimated, was not without its influence. Without question, emotional factors also had a place making an objective and deliberate estimate of the situation difficult.

It must be granted that voices were raised in the political and military echelons pointing to the approaching reality but, analogously with the West, they considered that the war would not come until

later. We did not desire to risk our more or less stabilized national economy on such a test and place ourselves on a war footing. Pursuing further the course of the West, we did not perceive the real possibilities of the motorization and armoring of armies in the domain of operational maneuver.

For that reason, although our High Command committed a basic error, it seems to me that it was hard to avoid. This would have required the Government to run the risk, with respect to the national economy, of adopting visionary tendencies and permitting dictatorial powers similar to those possessed in Germany by Hitler.

Further Advances

Summarizing, it may be affirmed that Hitler owed his success, in the first phase of the war, to surprise by the new doctrine of military operations. It must be acknowledged that he estimated correctly the value of surprise and took proper account of the value of the time he had at his disposal for the conduct of his intended plays. His surprises were facilitated by political plays in the governmental echelon. He did not hesitate to attack without the declaration of war. He availed himself of various tricks, as, for example, in the Norwegian attack. Therefore, up until 1941, he reaped in full the fruit of this type of action. The results of later efforts aiming at the surprise of his adversaries by means of new weapons, that is, in the field of science and technique, were not successful.

His final attempt at the achievement of surprise was Von Rundstedt's attack in the Ardennes in December 1944. This movement was a great operational success when one takes into consideration the fact that the German concentration required the movement of about 20 large units. This was accomplished despite control of the air by the Allies. Nevertheless, this surprise, although a success from the operational point of view, did not produce the shattering results of 1939-41 since the enemy now understood the doctrine of armored attacks, possessed a corresponding war machine for proper reaction, and had control of the air.

Surprise in 1939-41 was made possible by a powerful technical development of means of combat, which was considerably more rapid than that at the time of World War I. It is also necessary to admit that is was man who accomplished the surprise, who knew what the developments could make possible in the conduct of war, and who did not hesitate to assume the risk of the building and employment of a war machine theretofore untried on the fields of battle. Technical advance in the means of combat continues even more intensively, perhaps, than before. In the domain of speed, we have the rocket projectile. Space continues to shrink. The possibility of planetary voyages are spoken of as something practical. In the field of means of destruction exists the atom bomb and, in its experimental stage, the hydrogen bomb. The race in the field of the mechanization and perfection of war machines is in full swing.

Many signs indicate that after World War II doctrines were formed from the experiences of 1939-41, for, in order not to be surprised in the field of military preparations, many things are now being done: staffs of technical advisors are maintained, and the young—and, therefore, those unencumbered with traditional routine—are advised to study doctrinal possibilities. However, we are witnesses of a basic doctrinal contention between the advocates of augmented blitzkrieg who proclaim the possibility of military decisions by operations from the air, by the use of the atom or hydrogen bomb, and the partisans of operations by means of "balanced" armed forces of a type closely resembling the armed forces of the period at the end of World War II.

Doctrinally, we are in a situation sim-

ilar to that prior to 1939. On the one side, we have theoreticians and visionaries seeking decision only by the aid of machines and augmented means of destruction; on the other, persons seeking a practical solution of the problem of national defense. This latter group is composed of persons who, perhaps, many times see the reasoning of the theoreticians but who realize that they would be confronted with numerous practical problems, such as the budget, training, and political obligations both domestic and foreign. They also take into consideration the risk existing in any drastic switch from one concept to another.

In their preparations for war, the Poles, in fear of surprise, made many efforts to avoid it. Information was sought concerning concentrations of German forces; undeclared war was even anticipated. However, the surprise came from the least expected quarter, the doctrinal. This side had been known, but belief in its efficacy was lacking for it had not been tested. Surprise in this form showed itself to be irresistible, not only in Poland but also in all the campaigns up to 1941. Today, it could be repeated if the doctrine of air warfare proved to be correct and if there were found an individual for its realization, as Hitler was in 1939.

Conclusion

In times of such great technical progress as those in which we are living, the factor of surprise with new means and methods of conduct of operations must be given first place in military preparations, especially if there exists a man or a government determined to make use of technique and science in complete detail. Compromises and half means are only wishful thinking which lead to calamity. For partners who are not in a position to compete on a basis of equality in the race for the technicalization of their war machine, there remains only the cold and factual appraisement of possibilities and the search for political and not military solutions.

It seems that the possibilities of technique and their influence on war machines indicate the need, as it were, of a revision of the established view that a new war, to a greater or lesser degree, begins just where the preceding one ended. The concept of balanced armed forces presently in force in the world seems to be the expression of this view. The fact is, however, that this view in 1939-41, on the one side, was the cause of a great surprise, as the military operations, in a general sense, proceeded under entirely different conditions of time and space than those of World War I. The theory of air warfare conducted by aviation and guided missiles, likewise calls for revision—if we have the future in mind.

From the vantage point of the years which have passed since 1939 and in the light of the problem posed, the question is presented of whether it would not be well to subject to revision the repeatedly severe judgments concerning the Polish military leadership or the Polish Armed Forces, both in the matter of preparations and the conduct of operations in 1939. This does not mean that one would not be able to discover errors. It would be proper, however, to judge these errors against the background of the conditions and views prevailing in Western Europe during the prewar period, the course of events of the first phase of the war, and the point of view of our real possibilities. In conclusion, I wish to state that I am taking the fact into account that this representation by myself of the effects of surprise on the results of the operations of the first phase of World War II, to a certain degree, is one-sided and somewhat overly vivid. War is too complex a phenomenon for one to be able to assign a single cause to its outcome. Nevertheless, in my opinion, the facts justify the assertion that surprise was the dominating factor.

BOOKS OF INTEREST TO THE MILITARY READER

INTERNATIONAL POLITICS. By Norman J. Padelford and George A. Lincoln. 719 Pages. The Macmillan Co., New York. $6.50.

BY MAJ DANIEL J. KERN, *USAR*

Classification of this book does not come readily. It is the reviewer's guess that this formidable tome will find its chief use as a textbook in college courses.

The authors believe that "the United States is in the business of international relations to stay, and it behooves responsible citizens to learn the business." The book's encyclopedic character may militate against that commendable objective.

Chapter IX, Conflict and War, of special interest to the military reader, is illustrative. It is believed that Homer Lea pointed more succinctly to the causes of war when he showed that a "convergence of interests" leads to conflict; and that both Kennan and Bullitt in their relatively slender volumes clarify with greater lucidity the keystones of American foreign policy.

With that in mind, the key statement in the book, which is also the key statement to Soviet policy, may be found in Chapter XIV, The Bases and Formation of Soviet Foreign Policy.

History has shown that Russian objectives have qualities both of durability and resiliency, irrespective of internal changes within Russia, and that the Kremlin policymakers return to them whenever an opportunity offers easy prospects of successful intervention.

GERMAN MILITARY INTELLIGENCE. By Paul Leverkuehn. 209 Pages. Frederick A. Praeger, Inc., New York. $3.50.

BY LT COL MARSHALL H. ARMOR, JR., *Arty*

Abwehr, which became the name of the intelligence service that contributed so significantly to Hitler's offensive successes, means in literal translation "Defense." In the early days of Germany's 100,000-man Army, the *Abwehr* was just what its name implied: the counterintelligence section of the German Ministry of Defense. Concurrently with the growth of Germany's military strength, however, the *Abwehr* also expanded until, by 1943, it was a full-blown intelligence agency some 30,000 strong.

Dr. Leverkuehn's book is a story of the *Abwehr* under Admiral Wilhelm Canaris, its chief from 1935 until his relief in 1944 for—evidently, among other reasons—giving Hitler accurate reports on the deteriorating situation in the Soviet Union. It is not, as the author hastens to point out, a complete history of every phase of the *Abwehr's* work in every land, but a collection of "the most important or typical episodes."

Accordingly, it is largely a collection of brief stories of espionage and intrigue, and of the Trojan-horse exploits of the Brandenburg Regiment. None of the tales in this volume is dull; however, some are phenomenal—as, for example, one of the development of the complete Danish Order of Battle, from scratch, in the short period of 4 weeks.

ABRAHAM LINCOLN. The Prairie Years and the War Years. By Carl Sandburg. 762 Pages. Harcourt, Brace & Co., New York. $7.50.

THE LIFE OF ABRAHAM LINCOLN. By Stefan Lorant. 256 Pages. McGraw-Hill Book Co., New York. $3.50.

BY MAJ JOHN H. CUSHMAN, *Inf*

The lessons of the American Civil War come best to that military reader who has a grasp of the times that set the stage for that mighty struggle. To know those times, in part or in full, one must get the feel of Abraham Lincoln, the unfathomable man who dominated the era.

Carl Sandburg has condensed his earlier works, the 2-volume *Prairie Years* and the 4-volume *War Years*, into a masterful single volume. Drawing on a lifetime of dedicated research, he details the origins and early development of Lincoln, and his impact on the struggle which shook the young United States. Most valuable, perhaps, is the clarity with which the author portrays Lincoln's character. Sandburg knows his subject as well as any man could, and he tells his story well.

Stefan Lorant's "short illustrated biography" was written on different specifications. Where Sandburg painted a portrait, Lorant draws a sketch. The author has used many illustrations, copies of some of Lincoln's addresses and letters, and numerous anecdotes to flesh out his digest of Lincoln's life, but it remains a digest. We may live in an age of briefings, but such will never do justice to this particular subject.

Of the two biographies, Sandburg's is far superior and well worth the additional expense. To the reader already familiar with Lincoln, Lorant's volume will offer little that is new; to the unfamiliar, it will serve only to arouse interest in what has been omitted. Sandburg's work is definitive, thorough, and superbly written—a biography high on the list of those the military reader should own.

VICTORY RODE THE RAILS. The Strategic Place of the Railroads in the Civil War. By George Edgar Turner. 419 Pages. The Bobbs-Merrill Co., Inc., Indianapolis, Ind. $4.50.

THE CUSTER MYTH. By Colonel W. A. Graham, USA, Retired. 413 Pages. The Stackpole Co., Harrisburg, Pa. $10.00.

SOLDIERS OF THE AMERICAN ARMY, 1775-1954. By Fritz Kredel and Frederick P. Todd. 144 Pages. Henry Regnery Co., Chicago. $12.50.

BY COL DONALD L. DURFEE, *Inf*

This beautifully executed book on many of the uniforms of the American Army contains 32 full page drawings which depict the uniforms in colors. The drawings were made by Fritz Kredel who consulted many well-known authorities to ensure accuracy in his portrayals.

Each color plate is accompanied by a 1-page text, written by Frederick P. Todd, which gives a brief description of the uniform and the history behind it.

All officers who have had an opportunity to see the book informally have expressed great admiration for it. This volume is one which could well take its place in any officer's private library.

Two additional books are planned by the authors which should be very well received. These are: *Uniforms of the American Navy and Marine Corps*, and *Uniforms of the World.*

THE ARAB WORLD. Past, Present, and Future. By Nejla Izzeddin. 412 Pages. Henry Regnery Co., Chicago. $6.50.

THE LIMITS OF THE EARTH. By Fairfield Osborn. 238 Pages. Little, Brown & Co., Boston. $3.00.

TWO EGGS ON MY PLATE. By Oluf Reed Olsen. 365 Pages. Rand McNally & Co., Chicago. $4.50.

SAILING AERODYNAMICS. By John Morwood. 124 Pages. The Philosophical Library, Inc., New York. $7.50.

BY CAPT RALPH J. BAUM, *USN*

This is an excellent treatise for a yachtsman who desires to learn "how" and "why" a sail makes a boat move through the water and who desires to improve the sailing qualities of his yacht, be it large or small. The author treats the sail as an aerofoil, and explains the action of the wind upon various types of sails and rigs through the use of simple descriptions, graphs, and line drawings. This information is completed by the compilation of meteorological facts that should be of value to yachtsmen, especially those interested in inshore racing.

THE BATTLE HISTORY OF THE FIRST ARMORED DIVISION. By George F. Howe. 450 Pages. Combat Forces Press, Washington, D. C. $6.50.

BY LT COL CARL N. DEVANEY, *Armor*

This book provides an insight into the birth and development of our Armed Forces when the threat of war has been thrust upon our country.

In June 1941, nearly a year after the activation of the 1st Armored Division, only 66 American medium tanks existed; antitank guns larger than 37-mm and howitzers larger than 75-mm were still in the future. The division entered combat in late 1942, equipped with light tanks armed with a 37-mm gun and medium tanks with the low velocity 75-mm gun in the sponson mount.

The book contains nearly 200 pictures of historical interest, 40 sketch maps, and appendices which relate statistical and technical information.

It is an excellent account of the history of the first armored division to go overseas, the first to engage German troops in World War II, and the first in the number of days of actual field service in World War II.

THE HYDROGEN BOMB: The Men, The Menace, The Mechanism. By James R. Shepley and Clay Blair, Jr. 244 Pages. David McKay Co., Inc., New York. $3.00.

BY LT COL FRANCIS R. SULLIVAN, *CE*

This book is a *Time* magazine-like feature article on the unclassified aspects of the development of the thermonuclear weapon—the so-called hydrogen bomb. The title implies a threefold discussion—the men involved in its development, the ill-foreboding nature of the weapon, and a description of the weapon itself. The men and menace are discussed in detail.

The hero of the piece is Dr. Edward Teller who almost singlehandedly fought to overcome resistance to the "super," and to get it built. The authors do a fairly convincing job in presenting their theme—that the development of the hydrogen bomb was delayed 4 years and that this undue delay was nearly fatal to United States capabilities for balancing the threat of Soviet power.

They allege and reasonably demonstrate that this position of weakness was totally unwarranted and was peculiarly related to an insidious influence of Dr. J. Robert Oppenheimer. Their information on Dr. Oppenheimer is no more complete than was publicly released by the Atomic Energy Commission and other sources at the time of his suspension from receipt of classified information. As the authors say, the debate on the Oppenheimer case may go on for years—but they conclude there was certainly error in judgment if no "evidence" of treason. However, "it is not criminal to be wrong about the weapons of the atomic age, only fatal."

FRANZ VON PAPEN (Memoirs). Translated by Brian Connell. 634 Pages. E. P. Dutton & Co., Inc., New York. $6.50.

WINGS OF THE WIND. By Peter Stainforth. 263 Pages. The Falcon Press, London. $3.25.

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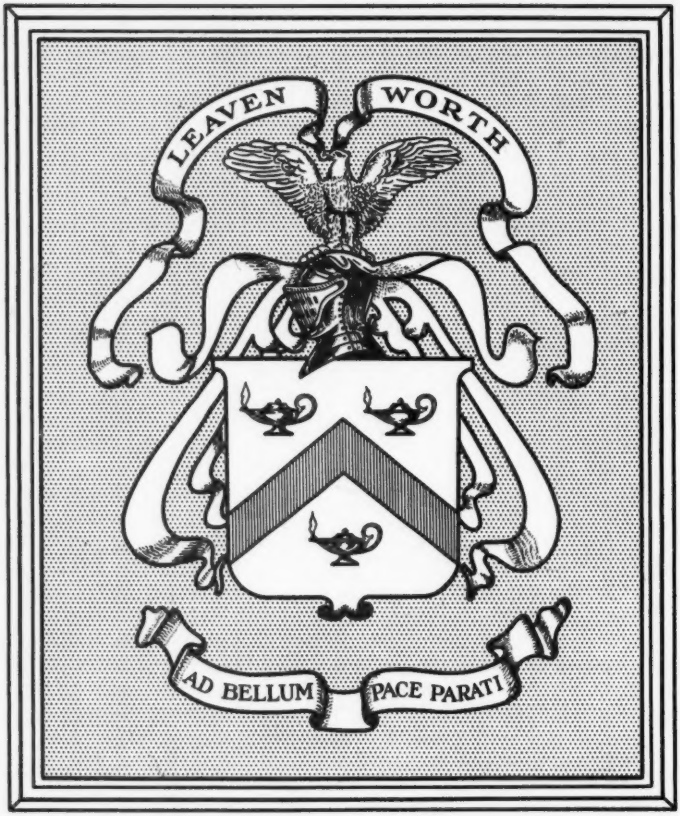

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